Farm Chemicals

Pioneer Journal of the Industry

Harold Ostvold, Asst. Prof.
U. Of Minn., Inst. of Agr.
St. Paul 1, Minn.

MARCH 1955 50 Cents

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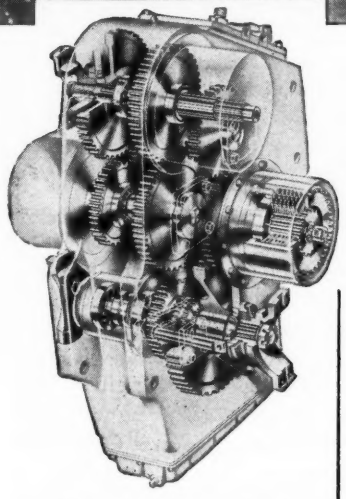

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Farm Chemicals

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Vol. 118 MARCH, 1955 No. 3

Cover Story

Formal dedication of the $7 million U. S. Industrial Chemical co. nitrogen plant at Tuscola, Ill., took place on January 21 as reported in an article on page 28. Pictured on this month's cover is a portion of the ammonia synthesis area.

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In this issue . . .

A completely new Wm. B. Tilghman co. plant has been completed at Pocomoke City, Md., site of the old plant which was completely razed in a disastrous fire during November, 1953. See page 33 for a description of the new facilities.

Beginning on page 35 is the conclusion of Walter M. Kulash's paper on insecticide-fertilizer mixtures. This month the author covers some of the problems that are associated with these materials.

NAC Association has a fine program scheduled for its St. Louis meeting this month. True D. Morse is featured speaker on the agenda which include panel discussions of the Miller Bill, herbicides and soil insecticides. See page 41 for more information.

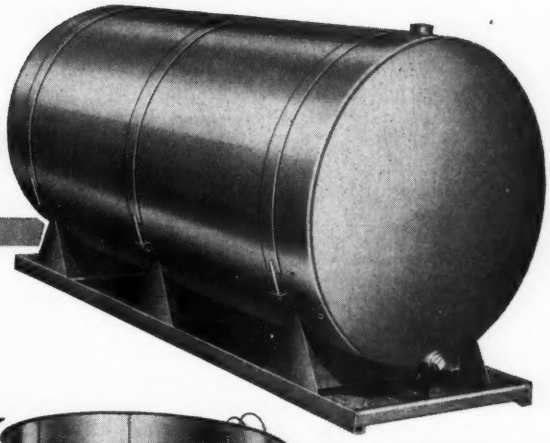
Final rules have been issued covering pesticide tolerance petitions and, on page 41, John Harms reviews some of the important changes made following discussion of preliminary regulations. Included is a table showing the new fees schedule.

Brief coverage of the Northeastern Weed Control conference appears on page 44 with some data on a few of the more interesting papers.

At the recent Cotton Insect Control Conference, USDA's E. F. Knipling presented a fine paper on the past and future of entomology research. We are especially pleased to present his remarks in this issue, beginning on page 45. K. P. Ewing addressed the conference on problems needing expanded cotton insect research and his talk will appear next month.

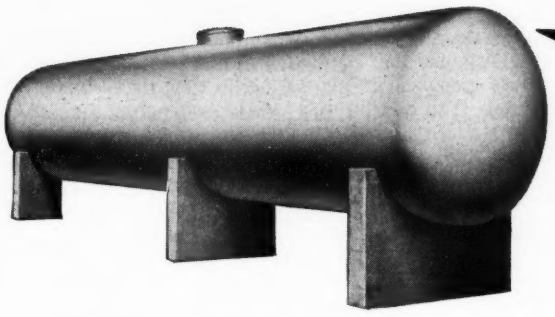
See page 49 for an article by George F. Polzer, of American Cyanamid's Purchasing department in which he describes the faults of some present-day salesmen. Polzer admits that purchasing agents also have their troubles and lists some of their more common failings as well.

For farm storage...

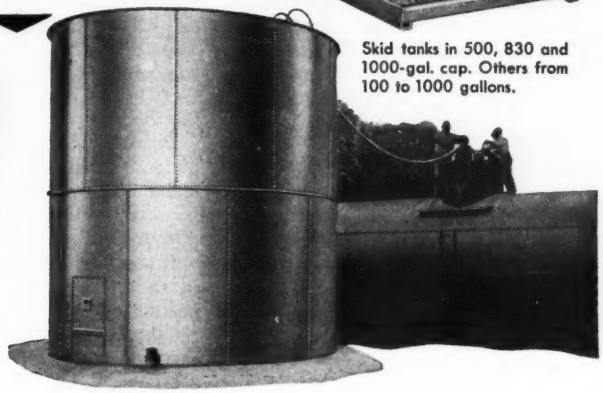


Skid tanks in 500, 830 and 1000-gal. cap. Others from 100 to 1000 gallons.

For bulk storage...



Welded low-pressure tank for bulk storage. In 12,000 and 22,000-gallon capacities.



Bolted 22,000-gallon non-pressure tank for bulk storage.

Profit with BUTLER aluminum tanks for liquid nitrogen solutions

Cash in on the amazing upsurge in use of liquid nitrogen fertilizers. Butler now offers you two new types of special alloy non-corrosive aluminum bulk storage tanks for liquid nitrogen solutions.

One is a bolted vertical 22,000-gallon tank for non-pressure solutions. The welded tank—in 12,000 and 22,000-gallon capacities—is a horizontal bulk storage tank for low-pressure solutions, available to code specifications.

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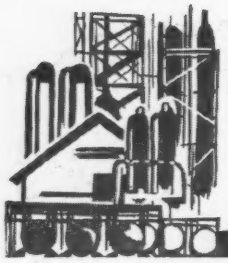

INDUSTRY NEWS

Reveal New DDVP Insecticide

PUBLIC Health Service researchers have reported discovery of a new insecticide said to possess important advantages over current materials. Official announcement of the material, named DDVP, was made by Oveta Culp Hobby, secretary of the Department of Health, Education and Welfare.

Developed by Dr. George W. Pearce, Chemistry section chief, and chemists Arnold M. Mattson and Miss Jane T. Spillane of the service's laboratory at the Savannah, Ga., communicable disease center, it is an organic phosphate, chemically known as dimethyl dichloro vinyl phosphate, and is termed more toxic to insects and less dangerous to warm blooded animals than many of our current pesticides.

DDVP has not yet been approved for commercial use but Montrose Chemical company, Newark, N. J. has reported that it is producing the material on a pilot plant scale and is offering it for experimental purposes to properly qualified organizations.

The effectiveness of this new pesticide on flies is especially significant as shown in one test involving a large dairy barn with a high population of DDT resistant flies. The pests were reduced to nearly zero in less than four hours by eight grams of DDVP, and it was estimated that 10,000 grams of DDT would have been required to do the job.

Because of its high volatility, the material is expected to prove useful on crops where pesticide residues are of importance and especially for control of mites and aphids.

It was first discovered as an impurity in another commercially produced organic phosphate and subsequent studies by the Savannah researchers led to a method of converting the commercial material to DDVP through dehydrochlorination. This process normally results in production of a relatively non-toxic compound but in this case produced a material ten times as potent as the parent compound.

Discovery of DDVP opens up an entire new class of pesticide materials and work is proceeding on investigation of other closely related compounds and variations.

Witco Buys Emulsol Chem.

Witco Chemical co. has acquired the Chemical div. of Emulsol corp. and has organized Emulsol Chemical corp.

Benjamin R. Harris continues as president, and Solomon Epstein, connected with the company for many years, will serve as executive vice president. Witco reports that no changes in personnel or policy are contemplated.

Benefits Seen from S. C. Law

South Carolina's new fertilizer law, which went into effect last July, makes possible uniform bag printing, eliminates unnecessary bags and permits Clemson College's Department of Fertilizer Inspection and Analysis to collect fertilizer usage data by grades and to enforce fertllizer laws in a more efficient manner, according to B. D. Cloaninger, department head.

Manufacturers now submit a copy of each invoice to the department within 48 hours after delivery of the fertilizer, instead of attaching tax tags.

Net weight, brand name, grade, name and address of manufacturer must be printed on bags or on a tag attached to each bag of general crop fertilizer.

NPFI Convention Plans

Plans have been approved for a preliminary convention of the National Plant Food Institute at The Greenbrier, White Sulphur Springs, W. Va., on June 12-15, 1955.

Presidents Russell Coleman of NFA and Paul T. Truitt of APFC have announced that the preliminary convention will constitute the annual meetings of the memberships of the two groups, which will consolidate officially on July 1, 1955.

Staffs of both organizations will make the arrangements for the joint convention and the program will soon be announced.

"Weather or Not" Released by NFA

"Weather or Not," a new educational motion picture which portrays how farm profits can be boosted by the fertilizer-irrigation team, now is available for distribution, the National Fertilizer Association reports.

Cooperating in the production of "Weather or Not" was the Sprinkler Irrigation Association. The Advisory committee on the film included representatives of the American Society for Horticultural Science, the American Society of Agricultural Engineers and the American Society of Agronomy.

Professional actors appear in the film, which is designed principally for use in the humid regions of the US east of the Rocky mountains. A farmer and his son, both dairymen, compete to see which can produce the most profitable pasture, the farmer with sprinkler irrigation and heavy fertilization, or the son using routine pasture management practices. Each keeps complete records, and at year's end they compare cost and profit figures.

The 16 mm sound-color movie, which runs 21.5 minutes, is the second educational picture produced by NFA during 1954. The other, "The Big Test," was released in December. Both pictures were produced by NFA's Robert H. Engle.

NFA reports that all its movies may be borrowed free of charge by sending a request to the association at 616 Investment Building, Washington 5, D.C.

Acid Plant Discussed

The Chemical div. of the Business and Defense Services Administration invited a group of sulfuric acid manufacturers in the Chicago area to a conference in February to discuss problems related to disposal of spent sulfuric from the army's Kankakee arsenal at Joliet, Ill.

NH_3 Carload Rates Changed

On February 10, anhydrous ammonia rates in carloads were changed from Column 35 to Column 30 of Docket 28300 rates, effecting a rate reduction in and between Official, Southern, Western Trunk Line and Southwestern Territories.

New Pennsalt Plant Opened at Delaware, O.

A new plant has been opened by Pennsylvania Salt Manufacturing co. at Delaware, O. The plant, Pennsalt's thirteenth production facility, is a component of the company's Chemical Specialties div. A similar installation at Chicago Heights, Ill., was dedicated on Feb. 10.

These plants will serve as blending, packaging and warehousing centers for Pennsalt's growing specialties markets in the east-central area and are the first of a number of projected units designed exclusively for this purpose.

Included among the products produced in the new plants is the Knox-Out line of insecticides.

New NAC Quarters

The National Agricultural Chemicals Association moved on Feb. 1 from 910-17th St., N. W., to Associations Building, Suite 603-604, 1145-19th St., N. W., Washington 6, D. C. Telephone number, STerling 3-2833, remains the same.

Borax Deal Off, Firm May Move Hq. Here

Negotiations with an American syndicate seeking to acquire control of Borax Consolidated, Ltd. have been called off by the British firm. An offer of the equivalent of $14 a share for 3 million deferred common shares made by Model Roland & Stone, New York, and Capital Research and Management co., Los Angeles, was rejected as inadequate.

If some tax relief is not granted Borax Consolidated by the British government, the firm may try to move its headquarters to the United States, company president D. Abel Smith stated.

Sandusky Firm Name OK

An injunction sought by Consolidated Chemical Industries, Inc., of San Francisco, to prohibit Consolidated Industrial and Agricultural Chemicals, Inc., Sandusky, O., from using the name "consolidated," was refused last month by U.S. District Court Judge Frank L. Kloeb.

The San Francisco firm claimed that adoption of "consolidated" in 1953 by the Sandusky firm, formerly known as Michigan Fertilizer co., was misleading and deceptive and presented unfair competition. Judge Kloeb said he could not agree that use of the names would cause confusion or would deceive or mislead the public.

Tailings

The 1954 report on economic poisons from Virginia's Department of Agriculture & Immigration comments on the importance of safe storage of pesticides. Cited is a case in which a container of herbicide leaked, apparently because of rough handling, into a nearby package of vegetable insecticide dust. The condition wasn't noticed until the user reported that his treated vegetables were dying.

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For those who haven't yet obtained copies of official publication No. 8 of the Association of American Fertilizer Control Officials, the volume is available at $2.00 a copy. Order directly from B. D. Cloaninger, secretary-treasurer, P. O. Drawer 392, Clemson, S. C. Special discounts are offered on quantities of 100 or more.

◆ ◆ ◆ ◆

A. G. Bennett reports that 24 companies replied to a request for information on cotton dusts and sprays sold in Mississippi during 1954. Totals show that 3,779,109 acres were treated with dusts (10 lbs/acre) and 2,575,260 acres were sprayed (standard mid-season dosages).

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Orval Faubus, new Arkansas governor, has recommended that fertilizer, feed and seed be exempted from a state sales tax.

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U. S. coop fertilizer plants are the subject of an article by J. Grindrod in the Jan. 5 FERTILIZER & FEEDING STUFFS JOURNAL. Mentioned in the piece were facilities of Mississippi Chemical corp., Consumers Coop. Assn., Missouri Farmers Assn. and Southern States Coop.

◆ ◆ ◆ ◆

Dr. Walter P. Mortensen, formerly at the Univ. of Wisconsin and now at Washington's Puyallup station, reports that sodium in the soil produces marked increase in yield and quality of many crops. Sponsored by the Salt Institute, his research showed yield increases with sugar beets, oats, barley and wheat.

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A mailing list is being set up for persons and firms who wish to receive issues of a USDA Agricultural Marketing Service series relating to stored products insects. Randall Latta, head of the Stored-Product Insects Section, Biological Sciences Branch, AMS, suggests that interested persons write the Biological Sciences Branch, Agricultural Marketing Service, USDA, Washington 25, asking to be placed on the mailing list for the AMS series.

US Steel Color Film

"Waiting Harvest," a new color film just released by United States Steel corp., traces the development of coke-making operations from the early industrial era to modern coke ovens which channel it into processing units where the important chemical components are extracted.

How gases are treated at US Steel's coke and chemical plants to produce benzol, toluol, xylol, ammonium sulfate, creosote, pyridine, naphthalene and other chemicals also is shown.

For information on booking on a free loan basis, write the Motion Picture and Visual Aids section, Advertising div., US Steel, 525 William Penn Place, Pittsburgh 30, Pa.

New Liquid Fert. Group

Organization of a new group known as the National Association of Complete Liquid Fertilizer Manufacturers was recently reported by the National Fertilizer Association in its NFA NEWS.

The new group is a separate entity from the National Nitrogen Solutions Association recently formed in Shenandoah, Ia., and its interest lies in complete liquid plant foods.

International's New Triple Superphosphate

cuts mixing costs

PLANT food manufacturers who already have switched to International's new Triple Superphosphate agree: its improved particle size and fine, virtually dust-free texture reduce mixing and handling costs. This uniformly fine texture cuts down the need to grind before mixing — assures faster, more complete ammoniation — promotes better granulation in high analysis formulations. Proper conditioning before shipment means less setting up en route — results in more economical handling and higher product performance. International's new Triple Super provides these extra benefits because it's made by an improved process from the highest quality materials. It runs approximately 46% A. P. A. or higher — promotes better acceptance of your finished product — saves you time and money. It's available for immediate delivery to your plant. Write or wire the Phosphate Chemicals Division now for samples and quotations.

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The Nation's Largest Producer of Phosphates • *General Offices: 20 North Wacker Drive, Chicago 6*

Smith-Douglass Sells Nutro (RS115)

A pelletized, homogenized, complete fertilizer was introduced during February throughout southeastern United States by Smith-Douglass co.

Called Nutro Plant Food Pellets, the material is clean, dustless and odorless, says Smith-Douglass, and was designedwith the home gardener in mind.

Like coffee, Nutro can be purchased in two forms, regular or instant. Instant Nutro can be used in liquid or dry form. Both the pellets and the soluble instant form can be kept in storage indefinitely, say Smith-Douglass officials.

Mrs. John F. Hill, runner-up in last year's Mrs. Virginia contest, demonstrates Nutro while Tidewater Turfgrass Association officials observe.

Third member of the Nutro family is Nutronite, an all organic fertilizer guaranteed 9 per cent nitrogen, 90 per cent or better water soluble.

The company says that during the past two years test marketing without advertising has proved that these products have exceptional consumer appeal. A merchandising program, using newspapers, magazines, radio and TV has just been inaugurated to introduce the new products.

The company is looking for additional distributors to handle the Nutro fertilizer line. Those interested can obtain more information by circling 115 on the Reader Service Card.

North Central ESA Meet Set for East Lansing

On March 24–25 the North Central Branch of the Entomological Society of America will hold its tenth annual meeting in East Lansing, Mich. With "Today and the Next Ten Years" as its theme, the meeting will include individual reports on new chemicals, legislation and other insect control questions. Speakers include Harold Gunderson and Floyd Andre, Iowa State College; C. C. Alexander, Geigy co.; A. C. Hodson, the University of Minnesota; W. W. Sunderland, Dow Chemical co. and Roger Smith of Kansas State College. Chairman of the branch, Dr. T. C. Allen, University of Wisconsin, will sum up the opening session with a report on possible future achievements of the branch society.

In addition to the general program, several information section meetings will be offered. Cereal, legume, fruit, vegetable and forest crops will receive attention.

Better Pyrethrum Curing

More of the insecticidal pyrethrin in pyrethrum flowers can be saved through better methods of curing, according to scientists Lowman, Gersdorf and Mitlin, Agricultural Research Service, USDA. Working at Beltsville, they tried fermenting the flowers before drying them.

They concluded that the stability of the toxic constituents in pyrethrum flowers has been shown to be definitely improved by fermenting the flowers before drying and storing.

Plan More NFA Stickers

National Fertilizer Association reports that its "Fertilizer is a Better Bargain Than Ever" sticker has proved so popular that the second printing now has been exhausted and a third printing is planned.

Price of the stickers to members of the fertilizer industry is $3.50 per thousand in packages of 500 each, the association reports.

Korea FOA Fertilizers

An allotment of $17.5 million has been granted to Korea for the purchase of $15 million of nitrogenous fertilizers and $2.5 of phosphatic fertilizers, according to an announcement by the Foreign Operations Administration. Contracting period extends until June 30, with delivery period ending Sept. 30 for purchases, which may be made from US and possessions, Canada, Latin America, Japan and cooperating European countries.

Revised Household Chlordane Instructions

Instructions to manufacturers to guide them in labeling household type chlordane insecticides under the Federal Insecticide, Fungicide and Rodenticide Act are being revised, USDA has announced.

Limitation on strength of formula is relaxed in the revision from the present 2½ per cent for emulsions and solutions to 3 per cent, and from 5 per cent for dry powder formulations to 6 per cent. Also, use of pressurized dispensers, which ordinarily contain 2 per cent chlordane and should not contain more than 3 per cent, will be permitted. Such acceptable self-propelled sprays must deliver a coarse, wet spray.

Use of these insecticides in and around human dwellings will be permitted when their labeling shows that inside of premises they are intended for use only against one or more of the following: Roaches, waterbugs, silverfish, ants, brown dog ticks, carpet beetles, houseflies, wasps, mosquitoes, box elder bugs, crickets, scorpions and clothes moths. The revised instructions permit use of these insecticides for mothproofing of clothing and other woolens going promptly into storage and which will be dry cleaned before use after removal from storage.

The revised instructions continue to restrict use of these insecticides against fleas and bed bugs. They also forbid, in liquid formulations and pressurized sprays, labeling which makes claims for spraying in the air or for the use of fine mist sprayers, claims or directions that might lead to the contamination of foods, or claims for safety or nontoxicity, and specify application of sprays only to infested areas.

USDA said this revision is based upon chemical evidence that present manufacturing processes can eliminate from technical chlordane marketed for insecticidal uses most of the hexachlorocyclopentadiene that used to be present as an impurity in considerable amounts.

Objections Raised on Potash Lease Rules

Objections to the revised potassium leasing regulations approved last December were to have been discussed at a public hearing scheduled for Friday, Feb. 11, at the Department of the Interior in Washington, D. C.

Protests were raised by several potash companies against the revised regulations, particularly the requirement of a bonus payment of not less than $1 per acre and 15 cents per ton royalty for production of fringe acreages annexed to base holdings and the dating of preference right leases at the time of filing application rather than when the lease is finally issued.

Effective date of the revised regulations, Jan. 31, 1955, was suspended until further notice.

Four Cited by FTC

Recent Federal Trade Commission rulings cite these companies and products:

Foreign Products corp., 1270 Broadway, New York City and George Dugdale trading as **The Burleigh co.,** Towson, Md. charged with 13 counts of false advertising of Actumus. The material is imported from England by the New York concern and Dugdale is a dealer.

Richard H. Davimos and **Casper Pinsker, Jr.,** partners trading as Orchards, Orchard Guild and White House co., Harrison, N. J. FTC has adopted two initial rulings prohibiting false advertising of, among other things, Loamium, a soil conditioner.

Ra-Pid-Gro crop., Dansville, N. Y. An initial FTC decision would prohibit the company from making false statements in advertising its liquid fertilizer. It represents acceptance by the examiner of a consent agreeement entered into by the company. The company did not admit it had violated the law as alleged in the FTC complaint.

Washington Mushroom Industries, Inc., 2954 Admiral Way, Seattle, Wash., charged with false advertising in the sale of mushroom spawn and fertilizer.

New Battelle Gamma Unit

As part of a rapidly expanding program of nuclear energy research for industry, Battelle Institute is installing one of the country's largest gamma radiation sources. It may be particularly useful in activating or "triggering" chemical reactions that are vital to the development of better synthetic chemicals, rubber materials and new plastics.

Visit Pfizer Ag Farms

Seventy-five members of the Chemical Commercial Development and the Chemical Market Research Associations visited the Pfizer Agricultural Research and Development Farm at Terre Haute, Ind.

The visitors spent the afternoon inspecting the barns, buildings and laboratories which comprise the 700-acre research center. At a luncheon earlier in the day, Dr. J. H. Kane, Pfizer, vice president; Dr. Herbert G. Luther, director of the farm, and J. J. Thompson, manager of the company's Agricultural Sales div., addressed the group.

Plan Minerals Survey

Directors of the Bureau of Mines and Bureau of the Census have signed an agreement under which the two bureaus will cooperate in gathering statistics of mineral production and other operations of some 40,000 establishments in US mineral industries.

Main purpose of the agreement is to assure that special knowledge of the Bureau of Mines commodity experts and the special skills of the Census Bureau are effectively blended in conducting the first such census since 1939.

Coop Fert. Sales Up, Pesticides Down in 1952–53

Memberships in farmer cooperatives reached a record 7.5 million in 1952–53, according to a report from USDA, almost double the number of 10 years ago and slightly above memberships of 1951–52.

The 7.5 million figure represents some 3 million individual farmers, many of whom belong to more than one cooperative. Number of cooperatives showed a small drop—10,114 in 1952–53 compared with 10,166 the preceding year.

Cooperatives' fertilizer sales during 1952–53 were $216,207,000 an 18 per cent increase over the previous fiscal year, while insecticide sales of $23,987,000 represented a 3 per cent decrease compared with 1951–52.

Chemical Progress Week

The second Chemical Progress week has been scheduled for May 16–21, 1955, according to a recent announcement by the Manufacturing Chemists' Association, sponsor of the event.

"The purpose of the week," said William C. Foster, association president, "is to bring home to the American people the significance of the chemical industry in terms of their daily life. Last year we feel we got off to a good start. This year we hope to do even better."

TVA Equipment, Process Licenses to 52 in 1954

Fifty-two companies had been licensed at the close of 1954 to either manufacture equipment developed at TVA fertilizer plants, or to use processes developed by TVA fertilizer technicians. Forty-four of the licenses were either for the TVA-developed continuous mixer for the manufacture of superphosphate, or for the continuous ammoniation process which permits addition of low cost nitrogen to superphosphate of fertilizer mixtures.

TVA said that 2,600 persons visited its fertilizer plants at Muscle Shoals in 1954, including 651 "technical" visitors representing many private firms, both in the US and in other countries.

Thompson-Hayward Plans Expansion, Buys Carmen

An expansion program including purchase of seven branches of Carmen co., has been announced by Thompson-Hayward Chemical co. Its $160,000 tanking station in Dallas, Tex. which will package chlorine gas for distribution in the Southwest, now is completed.

Chlorine for industrial and municipality use will be supplied by Thompson-Hayward in the Lake Charles, La., and Corpus Christi, Tex., areas formerly served by Columbia-Southern Chemical corp., through arrangements recently completed with Columbia-Southern.

ILO Urges Substitutes

The International Labor Organization has urged that substitutes be sought for arsenic, benzine and materials containing silica in certain industrial processes and for certain poisonous substances used in agriculture.

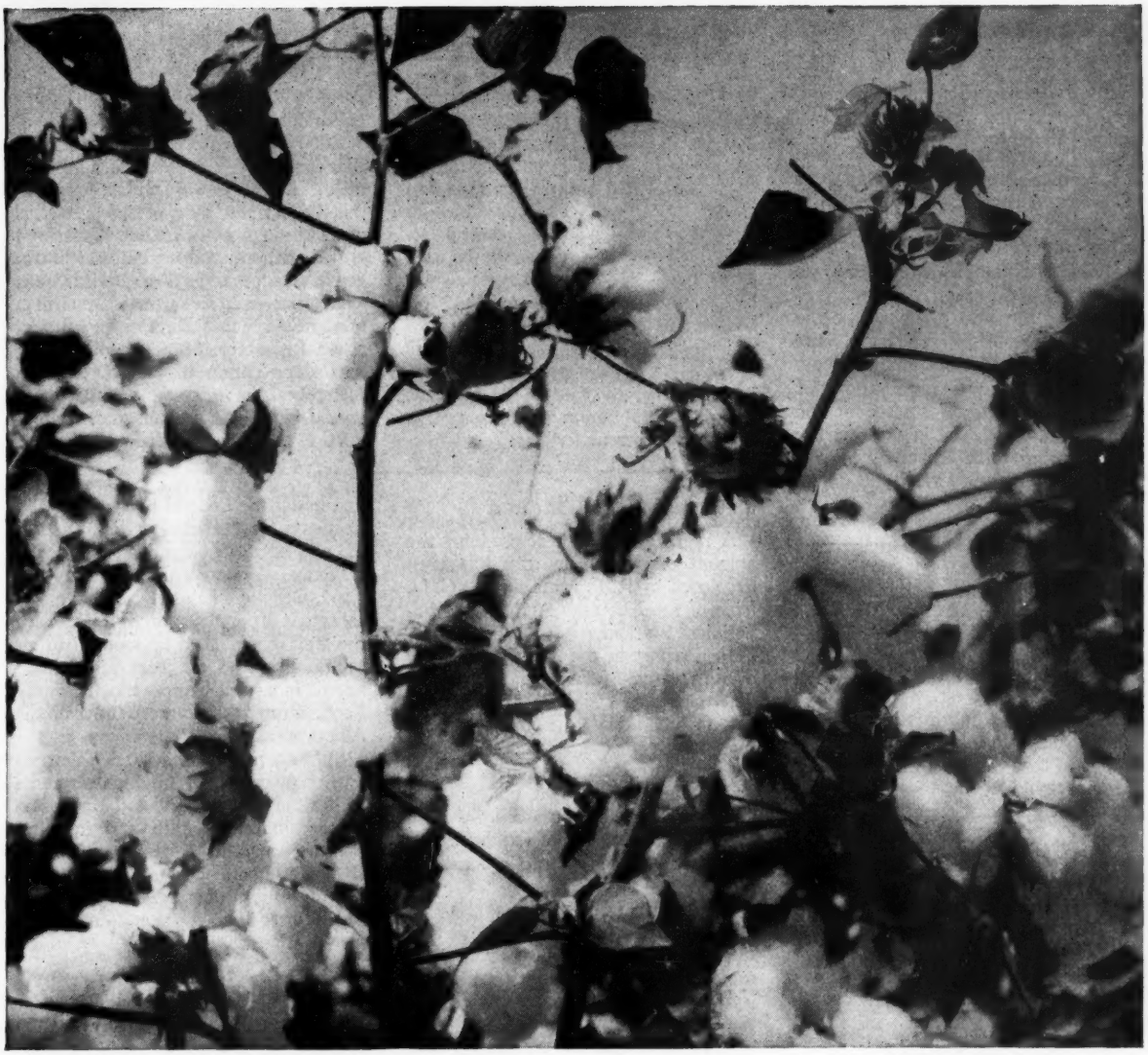
Farmers Need Weed Control Data

"The fundamental need for better weed control in cotton is simply to provide more factual information on chemical use to the farmer," Dr. E. D. Witman, manager of agricultural development for Columbia-Southern Chemical corp., told the Southern Weed conference in Jan. 18 in St. Petersburg, Fla.

"To date," Dr. Witman reported, "only a trickle of factual information on chemical weed control has reached the farmer from state and Federal authorities. Farmers are afraid to use chemical controls because of reports of injury, expensive specialized equipment needed, element of chance on retreatments of soil and cost factors which are based on rumors and hearsay. Many farmers and bankers are loathe to investigate chemical weed control and dismiss great savings merely because such 'new fangled' ideas have not been interpreted to them in a simple, factual way.

"This basic problem can be met," Dr. Witman reported on the basis of a survey conducted by his company, "with factual publications issued by state and industry groups giving accurate details of why weed control chemicals should be used, how they should be used and, in precise terms, what results may be expected. Based on the experience of the last few years in both research and field trials, we certainly have enough information to give the farmer proper guidance."

The necessary information should include, according to Dr. Witman, details on the chances of injury to crop—"facts, not blanket statements which leave an alibi for the author."



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Brea Plans New Plant

Brea Chemicals, Inc. recently filed, with the Orange county Planning Commission, a formal application for permission to construct a solid fertilizer plant adjacent to the recently completed Brea ammonia and dry ice plants three miles east of Brea, Calif., according to an announcement by Jack Tielrooy, manager of development.

Agricultural grade ammonium nitrate is expected to be the first product produced, and the Brea plant will be the largest ammonium nitrate plant in the Western United States, stated Tielrooy.

Latest equipment and precautions for safe manufacture and storage of the material were included in drawing the plans, he said, with absolutely no pollution of water, air or surface in the area.

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WANTED: Graduate chemical engineer. Prefer someone having experience in Continuous Ammoniation and Granulation. Position will require some traveling. Location in Middle West. In replying give complete information as to age, experience, salary, etc. Address "500" care FARM CHEMICALS, Philadelphia 7.

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Craft Forecasts Increase in NH_3 Use

Craft

Mark C. Craft, president of the Agricultural Ammonia Institute, predicts that anhydrous ammonia as a chemical fertilizer will be used in many new areas during the 1954-55 fertilizer season.

"USDA sources predict we will enjoy a further increase of 19 per cent in agricultural ammonia consumption during the current fertilizer year, handling 395,000 tons of the nation's agricultural nitrogen. . . . Instead of 395,000 tons, our leading institute authorities believe the agricultural ammonia industry will handle approximately 475,000 tons of nitrogen this year, or roughly 22 per cent of the total anticipated use of agricultural nitrogen in all types of fertilizer," said Craft.

Dr. Firman E. Bear, retired chairman of the Soils dept., Rutgers University, advised nearly 1,100 persons attending AAI's convention in New Orleans in December that nitrogen consumption should be at least double present production capacity.

Determining Soil Sodium

A rapid method for determining the amount of sodium in soils has been developed by R. P. Matelski and C. H. Yien of the Nebraska Agricultural Experiment Station.

In a report to the American Society of Agronomy, Matelski and Yien said determinations could be made in the field or laboratory in about one minute by mixing a small amount of soil with a zinc uranyl acetate solution in a small paper cup or on a spot plate. Rate and intensity of fluorescence—which indicates the amount of sodium in the soil—is measured with a commercial portable fluorescent meter.

Trials in the field and laboratory on about 100 Nebraska soils indicated that this method gives approximately the same results as the slower and more intricate flame photometric procedure, the report stated.

Airshipping Rate Change

Companies which export chemicals or pharmaceuticals now can save as much as 31.5 per cent on their international airshipping costs as a result of new specific commodity tariffs instituted by Air Express International corp., according to C. L. Gallo, president.

Export shipments of 50 lbs. and over to major world destinations are eligible for substantially lower rates via Air Express International than regular airline specific commodity rates which generally require 100-lb. minimums. As an example, Gallo said a 50 lb. package shipped from New York or Newark, N. J. to Paris, France, would cost $58.50 regular airline, compared with $37 via Air Express International.

FDA Inspection Problem

It would take the Food and Drug Administration between 11 and 12 years to make a single inspection of each of the 96,000 establishments subject to inspection under the Federal Food, Drug and Cosmetic Act, stated George P. Larrick, recently appointed commissioner.

"Since adequate enforcement of the Food, Drug and Cosmetic Act in all its aspects is an obvious impossibility with the staff available, it is essential to establish priorities for work allocation," he said in a speech before the division of Food, Drug and Cosmetic Law of the American Bar Association.

"We plan, therefore, to give first attention to problems involving hazards to health; second, to violations involving decomposition, filth and insanitation and third, to violations which constitute economic cheats such as short weight, water substituted for valuable laod, substandard foods and other simifor violations."

Natl. Ammonia Co. Buys DuPont N. Phila. Facility

DuPont co., effective Dec. 31, sold its North Philadelphia facility for loading, storing and shipping cylinders of anhydrous ammonia to National Ammonia co.

Manufacture of anhydrous ammonia will be continued as in the past at its Belle, W. Va., plant, stated DuPont, and adequate supplies of bulk ammonia have been guaranteed the purchaser to maintain the Philadelphia business on an uninterrupted basis.

DuPont has made available to the purchaser lists of all agents and customers in territories served from the North Philadelphia facility and has assigned the company the right to its trademark, "National" anhydrous ammonia.

The purchaser has agreed to give the same service on at least equal terms as provided by DuPont.

Gosta Hallberg, general superintendent of the North Philadelphia operation who has been with DuPont for 26 years, will retire on Dec. 31 to become president of National Ammonia co.

Independent Labs Protest Phrasing of Tax Code

The American Council of Independent Laboratories on Jan. 14 filed with the Bureau of Internal Revenue a statement concerning a phrase in the new tax code, "testing for public safety."

Composed of tax-paying private laboratories, it believes that the new exemption of "testing for public safety" can conceivably provide a tax loophole for various tax favored or tax exempt research institutes, universities, colleges and "so-called" non-profit commercial institutes so they may engage in testing operations and thus deprive the government of rightfully payable taxes.

It has asked Internal Revenue to review the subject in a public hearing contending that this broad field of testing was opened up in the code without any open hearings or debate in Congress upon the subject, despite the fact that the courts had held a different point of view for many years.

Foster Views Problems

Four major problems challenging the future of the chemical industry and the country, are future resources of energy, the effect of new technology and changing economic conditions on human health, the training of men and women to manage increased technology and the advancement of fundamental research, stated William C. Foster, president of the Manufacturing Chemists' Association, in a speech before the Drug, Chemical and Allied Trade section of the New York Board of Trade recently.

The problems selected, he explained, represent areas in which the chemical industry is doing concentrated, long range work.

Package Machine Directory

A new directory covering makers of all types of packaging machinery has been published by Packaging Machinery Manufacturers Institute. Designed as a ready reference for purchasing agents, factory superintendents and others interested in this type of equipment, the directory is divided into three sections for easy reference. One lists trade names of equipment and names of manufacturers; another lists the kind of equipment available and names of manufactures and a third section, alphabetically arranged, gives names and addresses of machinery makers and complete information on machines each makes.

The leather covered directory is available for $10 from the institute, 342 Madison Avenue, New York City 17.

OVERSEAS

Japanese Pesticides

The Japanese pesticide industry is well developed and can supply most of the country's requirements, according to a Department of Commerce report. However, the lack of adequate basic research results in dependence on outside sources for new materials.

Although sulfur, lime, arsenic, chlorine and pyrethrum are produced in Japan, many raw materials needed for production of synthetic pesticides must be imported. Parathion production started recently and is expected to fill all requirements this year. Production of MCP began early last year and in August, of calcium cyanide.

Low cost pesticides are popular because of the low Japanese income levels although US pesticides, often higher in price, are considered of better quality than those from many other countries.

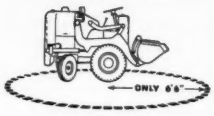
Establishing a Japanese market, according to the Commerce dept., means more than advertising—favorable reports must be given by national and prefectural agricultural experimental stations.

Production of agricultural pesticides

Lower tilt-back, lower carry

— loads without need for spinning wheels, travels faster

Bucket can tilt back to loosen tough materials or flip in small loads.



5" shorter turning radius (6'6"). Faster speeds to 13.88 mph in reverse, 7.66 forward.

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totaled some 66,380 metric tons in 1953 (90,390 for the 1953–54 pesticide year) and consumption is estimated at 79,048 metric tons for 1954 and 101,940 for 1960.

Imports rose from $225,000 in 1950 to $2,556,000 in 1953 and are set at $1,538,000 for January-September 1954. A tentative import schedule for October, 1954–March, 1955 totals $820,000, with much of the material originating in the United States.

Australia. The $3.5 million sulfuric acid superphosphate plant of Sulphide Corporation Pty., Ltd. under construction at Cockle Creek, New South Wales, is expected on stream late this year. It will produce 2,000 tons of super a week and 100 tons of acid a day. Pyrites will be burned using the Monsanto vanadium catalyst method.

Egypt. Work has begun on a DDT plant at Kafr El-Zayat with financing aided by UN organizations. Estimated capacity of 700 annual tons is considered sufficient for current needs.

England. May & Baker, Ltd. has introduced a new herbicide containing 40 per cent MCPB (4-chloro-2-methylphenoxybutyric acid) and recommended for use on corn-clover and clover leys combinations.

India. Montecatini, Italy, will build a $14 million urea and ammonium nitrate plant at Bihar, adjacent to the Sindri works.

Venezuela. Montecatini has signed to build a fertilizer plant designed to produce 30,000 tons of synthetic nitrates yearly. The company will make available its own patents and will grant technical assistance until the unit is ready and local labor is trained.

A subsequent announcement concerns an agreement for a plant with capacity of 80,000 tons ammonium nitrate and ammonium sulfate, 18,000 tons urea and 100,000 tons superphosphate, plus nitric acid and oleum.

West Germany. Exports of potash, 42 per cent of industry production last year (as K_2O), is expected to reach 50 per cent in 1955. Extensive deliveries were made to most west European countries in 1954 while shipments to the Far East, especially Japan, showed gains.

People

New technical director for **Alabama By-Products corp.,** Willard M. Mobly, will head the company's recently-created Technical Control and Research dept.

H. C. Little has replaced Horace V. Cory as assistant general manager of **American Cyanamid co.'s** Agricultural Chemical div. Cory has retired after 32 years with the company.

New director of employee relations for **Cyanamid** is Murray Owen, former assistant to the director of employee and public relations.

Hoffer

On Jan. 1, Dr. G. N. Hoffer retired as midwest manager for **American Potash Institute,** a position which he has held since formation of the institute in 1935.

Dr. Werner L. Nelson, who resigned from North Carolina State College last October to work with Dr. Hoffer, has been named midwest manager.

Hampson

Pennington

On Feb. 1, Dr. Roy P. Pennington assumed active management of the **Institute's** Canadian office in Hamilton, Ont., succeeding E. K. Hampson, who has retired.

Dr. Pennington returned to Canada after serving from 1949–1955 in the Agronomy dept. of Pennsylvania State University. Hampson had been Canadian manager for the institute since 1935.

Died: Charles Austin, 41, plant supervisor at **Armour Fertilizer Works** Sandusky, O., plant, on Jan. 8, from acid burns and gas inhalation received when an ammonia gas line ruptured at the plant.

Eight other workers also were reported to be victims of burns and fumes.

Atlas Powder co. has named Robert C. Bennett manager of its new food emulsifiers plant at Memphis, Tenn., which began production in late February. Paul G. Briggs has been appointed plant supervisor.

Harold Ferguson, former vice president of Naco Fertilizer co., has been appointed senior assistant to Dr. R. E.

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Neidig, vice president, Fertilizer and Chemical dept., **Balfour, Guthrie & co.**

Bemis Bro. Bag co. personnel shifts: C. C. Cobb to resident manager of the St. Louis paper specialty plant; J. T. Trotter to sales manager of the East Pepperell multiwall paper bag plant; and C. C. Smith to Buffalo plant merchandiser. D. G. Chase has been named sales manager for the Buffalo Sales div.

Bemis's W. D. McLean left in mid-February for India and Pakistan to appraise the current jute and burlap supply situation.

Died: E. B. Roberts on Jan. 9. He was manager of the **Bemis** Peoria paper mill and multiwall bag plant before retiring in 1949.

McKenzie, Siciliano, Wheatley & Kessler.

New territorial assignments for four Carbide & Carbon Chemicals co. ag sales reps: M. J. Siciliano transferred to the Chicago district office and assigned to central US; J. R. Wheatly assigned to southeastern US; R. R. Kessler, eastern seaboard from New York to South Carolina and R. E. McKenzie, New England and New York State. The latter three men will continue to work out of the company's New York City office.

California State Polytechnic college president Julian A. McPhee and Mrs. Dorothy B. Jonson, widow of the late "Dr. Bill" Jonson, founder of the **Destruxol corp.**, have announced that Cal Poly will be the home of the William L. and Dorothy B. Jonson Scholarships in soil science.

Chase Bag co. has named H. E. Dennie manager of its Philadelphia branch. Dennie, former branch sales manager, succeeds J. P. Grady, who continues as eastern regional sales director.

E. P. Alexander, former manager of Chase's Detroit office, has been named sales manager at Chicago; D. B. Fendler named sales manager in Detroit and J. F. Pouchot appointed to the Sales Promotion dept.

Gen. Edward Montgomery has retired as director of procurement for **Chemical Construction corp.**

Gardner

Commercial Solvents corp. has appointed Lawrence R. Gardner purchasing manager. He had been purchasing agent for the Egyptian Lacquer Manufacturing co. and also has been employed by Marietta and Monsanto Chemical.

William H. Kieser, Jr. has joined the Chicago sales staff of **Commercial Solvent's** Animal Nutrition dept.

Appointment of W. T. Brigham to a post in charge of all plant pest regulatory and inspection work in the state has been announced by Dr. James G. Horsfall, director of the **Connecticut AES.** Brigham will succeed Max P. Zappe, who is requesting retirement on April 1.

Charles W. Bowman, a new member of **Davison Chemical co.'s** Research and Development div., has been assigned to the Research Engineering dept. at the company's Curtis Bay (Baltimore) plant.

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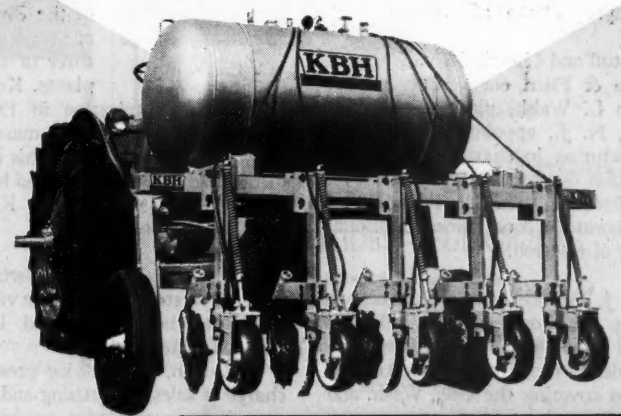


The KBH *Corporation*
CLARKSDALE MISSISSIPPI

C. E. Lyon, vice president and general manager of **Diamond Alkali co.'s** Chlorinated Products div., will retire on May 1. Appointed to succeed him is Loren P. Scoville, director of engineering. Scoville's present post will be filled by C. C. Brumbaugh.

Promotion of James O. King to special staff assistant, Sales dept., has also been announced by **Diamond.**

Dravo corp. has appointed H. W. North chief engineer of the newly-established Process Equipment dept. of its Engineering Works div.

A full time turf specialist, Robert T. Miller, has been appointed by **DuPont co.** to handle development and service work on turf applications of the company's pest control products and soluble plant foods.

Quentin Reynolds, **Eastern States Farmers' Exchange** general manager since 1930, will retire at the exchange's 37th annual meeting on March 4 and 5 in Springfield, Mass.

Promotion of Richard E. Cocks to plant superintendent of the Kalamazoo, Mich., plant of **Farm Bureau Services'** Plant Food div. has been announced.

Robert R. Cutler and C. J. Haglund have been elected vice presidents of **H. K. Ferguson co.** Cutler will manage the Central district and Haglund, the Western district.

Two new vice presidents—Fred G. Barnet and E. Monroe Hornsby—have been named by **Fulton Bag & Cotton Mills,** and Robert O. Arnold, Herbert R. Elsas, William E. Mitchell and James D. Robinson, Jr. have been elected to the company's board of directors.

Dyestuff and Chemical div., **General Aniline & Film corp.** changes: Dr. William L. Walsh, plant manager at Linden, N. J., appointed manager of manufacturing in charge of divisional production operations; Dr. Joseph W. Lang, director of research at the Easton, Pa., laboratory, was named divisional director of research.

Paul J. Pernice has been named to head up the Portland, Ore., office of General Dyestuff co. and Antara Chemicals, sales divisions of **General Aniline & Film** covering the Ore., Wash. and Ida. territory.

H. D. Wellington, formerly with Bagpak div., International Paper co., has been named western sales manager of **Gilman Paper co.** and its subsidiaries, with offices in the Daily News Bldg., Chicago, Ill.

Garman

Dr. William L. Garman has been named agricultural service manager by the **Grand River Chemical div.,** Deere & co. Previously Dr. Garman was assistant professor of soils, Agricultural Experiment Station and Agricultural Extension Service, Cornell University.

Great Lakes Carbon corp.'s board of directors has announced the election of Michel E. Puyans as vice president-finance and William O. Ashe as treasurer.

Election of Frederic H. Courtenay as secretary, Clark L. Kelly, Jr. as assistant treasurer and appointment of

Courtenay

Kelly

England

Woodford N. England as advertising manager has been announced by **Federal Chemical co.** A Federal Chem. employee since 1950, Courtenay has worked in the Production and Sales depts. at three of Federal's plants. Kelly, who joined the organization in 1947, has served as assistant credit manager for the past two years. Until his appointment as ad manager, England had been working in the company's Kentucky Sales div.

Promotion of G. A. Gilbertson and R. L. Beyerstedt to executive vice presidents has been announced by **The Frank G. Hough co.**

Gilbertson, former vice president in charge of sales, advertising and service, now is executive vice president and general manager, and Beyerstedt, former vice president and chief engineer, is now executive vice president in charge of engineering and product development.

Sanford R. Bell has been promoted to plant engineer at **International Minerals & Chemical corp.'s** Bonnie chemical plant. Bell, who joined International's Phosphate Chemicals div. last April as project engineer, replaces Robert V. Safford, who was recently moved up to assistant manager of engineering at the Bonnie plant.

Died: Dr. William M. Jardine on Jan. 17. He had been secretary of agriculture in President Coolidge's cabinet and president of Kansas State College.

Jefferson Chemical co.'s new president is George R. Bryant, former vice president of The Texas co.

Ketona Chemical corp. appointments: Dana F. Sprague, works manager; Henry J. Weiland, assistant works manager; Donald G. Sentman, office manager and chief accountant and Hursel L. Browning, works engineer.

Porter

Richard P. Porter has been elected vice president of **Larvacide Products, Inc.** He will be responsible for sales of soil fumigants and horticultural specialties and development of new products. He goes to the company from Ethyl corp., where he was in charge of the agricultural chemicals field development program.

Paul D. Sullivan has been named assistant sales manager of **Le Roi div.,** Westinghouse Air Brake co. He will headquarter in Milwaukee.

Died: Dr. Thomas Lewis, 65, on Jan. 29 in New York. Before joining Gane & Ingram, he had been technical director and a vice president of S. B. Penick & co.

Full time activities as a vice president of **Arthur D. Little, Inc.** have been resumed by Dr. Bruce S. Old, former president and board chairman of Cambridge corp.

Newly appointed chief engineer for **Link-Belt co.'s** San Francisco plant is Russell J. Geitman. After joining Link-Belt in 1928 he worked at each of the company's two plants in Chicago, served as sales engineer at district offices in St. Louis, Cleveland and Chicago and since 1948 has been specializing in design and application of foundry and steel mill equipment.

Died: James E. Purdy, 60, president, controller and secretary of **Lummus co.,** on Jan. 9.

Billings

Mackwin co.'s new central states sales supervisor, E. M. Billings, will headquarter in Ankey, Iowa, to serve Mackwin's agricultural chemical customers in Missouri, Kansas, Nebraska, Iowa and southeastern South Dakota.

Died: Mrs. Mary J. McGowan Barry, wife of W. D. Barry, **Mallinckrodt Chemical Works** vice president, on Jan. 31 in New York.

Mexican Gulf Sulphur co. has elected David Van Alstyne, Jr., a director of the company.

Milwaukee Sewerage Commission's sales manager, Victor H. Kadish, has retired after 35 years of service.

Under **Monsanto Chemical co.'s** new organizational plan, William R. Farrell has been named advertising manager. Director of Public Relations H. A. Marple has been also appointed manager of the Monsanto Charitable Trust.

Dr. Robert E. Hulse, vice president of **National Distillers Products corp.,** has been elected to the company's board of directors.

David L. Arm, dean of the school of engineering at the University of Delaware, has been appointed manager of the Industrial dept., **National Safety Council.**

Alvin M. Chester has joined the staff of **National Service Associates** as assistant to the president. The company reports that it is the only private agricultural promotional firm in the East.

H. Clay Hansen has been appointed agricultural specialist in the Arkansas Fertilizer district for **Olin Mathieson Chemical corp.,** with headquarters at the company's North Little Rock plant.

He had been market analyst in the Western Fertilizer div. of the corporation at Little Rock.

Died: F. Elmer Oswald, president of **Pulva corp.,** on Jan. 11. He had been associated with the process equipment industry for about 28 years.

S. R. Zimmerman, Jr., has been named vice president of **Raybestos-Manhattan, Inc.;** R. J. Gorecki, director; H. H. Burrows, vice president —rubber sales and R. B. Hazard, sales manager—rubber and packing.

A new Emulsion div. has been formed by **Reichhold Chemicals, Inc.,** with John G. Penniman as manager.

Shea Chemical corp. has named J. B. Sutliffe and W. Newell Wyatt heads of its Industrial Chemical Sales depts. Sutliffe will direct eastern operations and Wyatt, western sales.

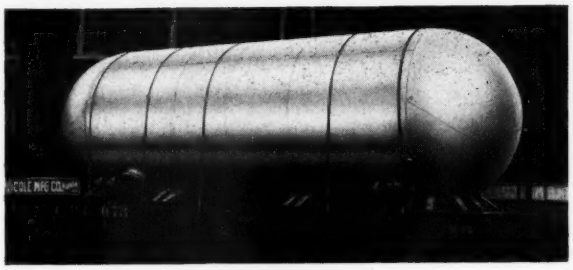
J. R. Willis, assistant to the vice president in charge of research, Sinclair Refining co., has been appointed chief process engineer of **Sinclair Chemicals, Inc.**

Sinclair Chemicals also announced that Earl Noblet has joined its Market Development dept.

Died: Ed Stevens, 67, chairman of the board of **Stevens Industries,** on Feb. 1 in Dawson, Ga.

New district manager of **Stone & Webster Engineering corp.'s** Chicago office is Franklin C. MacKrell, company vice president.

Died: William K. Jackson, Jr., 44, manager of the Packaging Services div. of **Union Bag & Paper corp.,** on Jan. 25.



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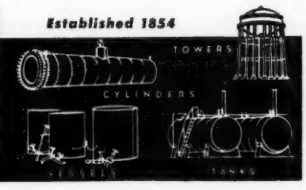

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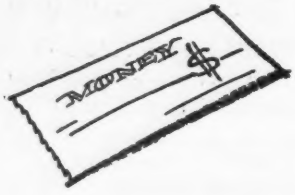


and a CHECKUP

give to
AMERICAN CANCER SOCIETY

H. W. Seyler has been appointed to the newly created position of assistant vice president, coal chemical operations, **United States Steel corp.**

Thomas C. Boushall has been elected a director of **Virginia-Carolina Chemical corp.**, filling a vacancy created by the resignation of Wymond Cabell.

R. Andrew Jenkins has been appointed assistant manager of **Virginia-Carolina Chemical corp.'s** sales office in Baltimore, Md.

Witco Chemical co. has added Harry G. Hoehler to its New York sales staff to cover the Philadelphia, Pa., and Baltimore, Md., sales areas.

Company Briefs

American Potash & Chemical corp. has moved its New York office from 122 East 42nd St. to 99 Park Ave.

Atlas Powder co. moved its general offices on Feb. 11 from the downtown Delaware Trust Building to a new building of its own on a 45-acre tract about three miles from downtown Wilmington. Grounds include a swimming pool, tennis courts and a baseball diamond for employee use.

Following an unsuccessful attempt on Jan. 4 to crack a safe at **Bone Dry Fertilizer co.'s** Richmond plant, burglars were reported to have penned the message, "You win. Thanks" on a cardboard box top which was found by police.

A contract has been awarded to Fluor corp. by **Calumet Nitrogen Products co.** for design, engineering and construction of new facilities to manufacture anhydrous ammonia and ammonium nitrate solutions at Hammond, Ind.

Construction is expected to begin this Spring, with completion scheduled for mid-1956.

A sales office has been opened by **J. C. Corrigan co.** at 420 Lexington Avenue, New York City. Telephone number: LE 2-9144. Gilbert Lavoie has been appointed sales engineer.

Diamond Alkali co. now is modernizing and enlarging certain key facilities of its Research Center in Painesville, O., at a cost of about $200,000 to meet the expanding needs of the firm's fundamental and applied research programs.

A new field sales office has been opened by **Dow Chemical co.** at 925 Common st., New Orleans, to serve an area including La., southern Miss., southwestern Ala. and northwestern Fla. The office will be under the direction of Glenn H. O'Neal, manager of the St. Louis, Mo., office.

Charles Albert Smith Ltd. has expanded its representation of **Emulsol Chemical corp.** to include all of Canada.

Glyco Products co. Change of address: Its executive and sales office from 26 Court St., Brooklyn, to the Empire State Building, New York City. New telephone number: OXford 5-5140.

Harshaw Chemical co. plans to make an offer to Zinsser & co. shareholders to acquire all outstanding stock of Zinsser in exchange for Harshaw common, according to a recent report.

A regional sales office has been established by **R. M. Hollingshead corp.** at 22 E. 40th St., New York City.

The potassium sulfate producing facilities of the Potash div., **International Minerals & Chemical corp.**, at Carlsbad, N. M., will soon be expanded to 40,000 tons per year capacity.

Knoxville Fertilizer co. has purchased 12 acres in Johnson City, Tenn., on which it will build a new plant, according to a recent report.

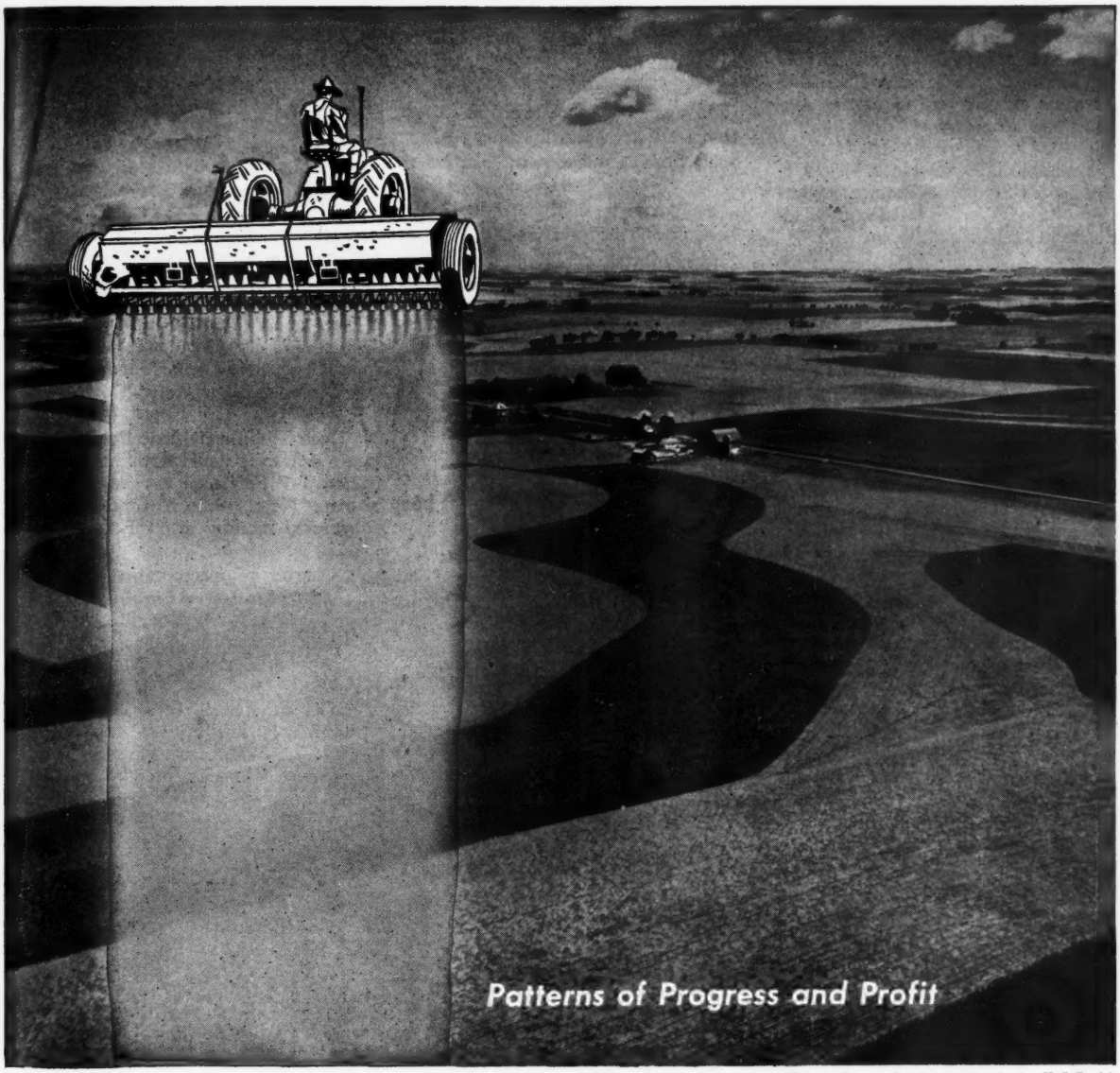
At **McConnon & co.'s** annual board meeting, J. R. McConnon was elected chairman of the board of directors, James McConnon president, H. G. McConnon, vice president and G. A. Ostrom, secretary treasurer. R. W. Lundberg, controller, and W. T. Lemmon, sales manager of McConnon's Mackwin co. div. were elected to the board of directors.

An additional filtering step is being used by **Mississippi Chemical corp.** in its ammonium nitrate operation to remove foreign matter which can lead to explosions and lowers decomposition temperatures and to salvage materials formerly sold as scrap.

Chemical Products, Ltd., Regina, Canada, has been acquired by **Niagara Brand Spray co.**, Burlington, Ont. Chemical Products' Regina plant and warehouse will serve as a base of operations for Niagara expansion in western Canada.

The Federal Power Commission has been asked by Dr. M. F. Folger, executive vice president of **Nitrogen div.**, Allied Chemical & Dye corp., to grant Northern Natural Gas co. authority to sell Allied 12 million cubic feet of natural gas daily on a firm basis.

If the gas is made available, capacity of Nitrogen div.'s LaPlatte, Neb., plant is expected to be doubled, at a cost of about $20 million.



(Photo — Courtesy Soil Conservation Service, U. S. D. A.)

High Grade Muriate of Potash

by DUVAL

Duval Muriate of Potash ranks high as one of the essential nutrients which greatly increase yield and profits in crop production.

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Modern Plant and Refinery at Carlsbad, New Mexico

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A new distributing center is being opened by **Olin Mathieson Chemical corp.** on Broadway in Greenville, Miss., to serve the Mississippi-Louisiana-Arkansas area, as well as part of Alabama and Tennessee.

Equitable Life Assurance Society of the United States has acquired ownership of the 34-story **Mathieson** Building at 10 Light St., Baltimore, Md.

A charter has been granted to **Pee Dee Chemical corp.,** Kingstree, S. C., to manufacture and distribute insecticides, with authorized capital stock of $25,000. The company's president is R. I. Snowden.

Pennsylvania Salt Manufacturing co. has acquired a major interest in Index Chemical co., Houston, Tex., producer of ethyl and methyl mercaptans and dimethyl and diethyl sulfides. Index activities will be integrated with the production and sales depts. of Sharples Chemicals, Inc., a Pennsalt subsidiary.

A warehouse has been opened at 5310 West 66th St. in Chicago by **Phelps Dodge Refining corp.,** and the company's Chicago sales office has been moved to the new location. Stocks of Triangle Brand copper sulfate and nickel sulfate are available for truck pickup.

A new district office has been opened by **Shell Chemical corp.** at 24 West Lewis St., Pasco, Calif. The company has also opened its new Pittsburg, Cal., ammonia plant and has almost completed storage facilities along a water route from the plant to the Northwest.

An ammonia unloading station has been completed at Buhl by **Simplot Soil Builders** of Twin Falls, Ida. Charles Lunte has been named manager of the new branch.

The company's resident manager at Swink, Colo., Larry Schumacher, has been holding a number of fertilizer meetings recently with farmers and dealers in his area, and has been promoting soil analysis work. This is one of the best ways to introduce use of fertilizer in areas where it has not been used to any extent, he reports.

Smith Agricultural Chemical co., Columbus, O., has been authorized by its stockholders to issue 150,000 shares of no-par common stock to replace its 50,000 shares now outstanding. It will be distributed to shareowners on the basis of three shares of new for each share of old stock held. The company's officers and directors have been re-elected.

Smith-Douglass co. reports that its safety record for the calendar year 1954 is the second best in the company's history. Accident frequency rate for 1954 was 3.92, a considerable improvement over the 7.92 rate for 1953. In 1951, Smith-Douglass set its all-time record of 2.88.

First place team in the company's safety league for Jan. 1–Dec. 31 was Maint. & Misc., Streater, Ill., with no lost time accidents in 176,060 manhours.

Production was expected to begin by late January at **Soil Builders International corp.'s** new enlarged plant at Clarksvile, Tenn. Product to be manufactured is "Glorion."

Ned Tyson and Merle Petersen now are delivering liquid fertilizer from the new **T-P Fertilizer co.** plant in Herman, Nebr., Schelm Brothers, Inc., reported recently in its TANK TOPICS.

Charter of incorporation has been granted **Tennessee Liquid Fertilizer co.,** 1315 East Court St., at Dyersburg, Tenn. Capital stock is listed as 800 shares at $50 each.

On Jan. 26 **Tri-State Chemical co.** formally opened its plant in Springdale, Ark. Open house began at 10:30 a.m. and the afternoon program included addresses by Tommie Haseloff, president

An Impressive Record Since 1891

Bradley Mills Grind More
FINELY GROUND AGRICULTURAL LIMESTONE
THAN ALL OTHER GRINDING MILLS COMBINED

The BRADLEY line includes a mill for every requirement—

The "B" TYPE JR. HERCULES MILL for the average producer.

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Capacities 5 to 40 Tons per hour, depending on the grindability of the rock and fineness required.

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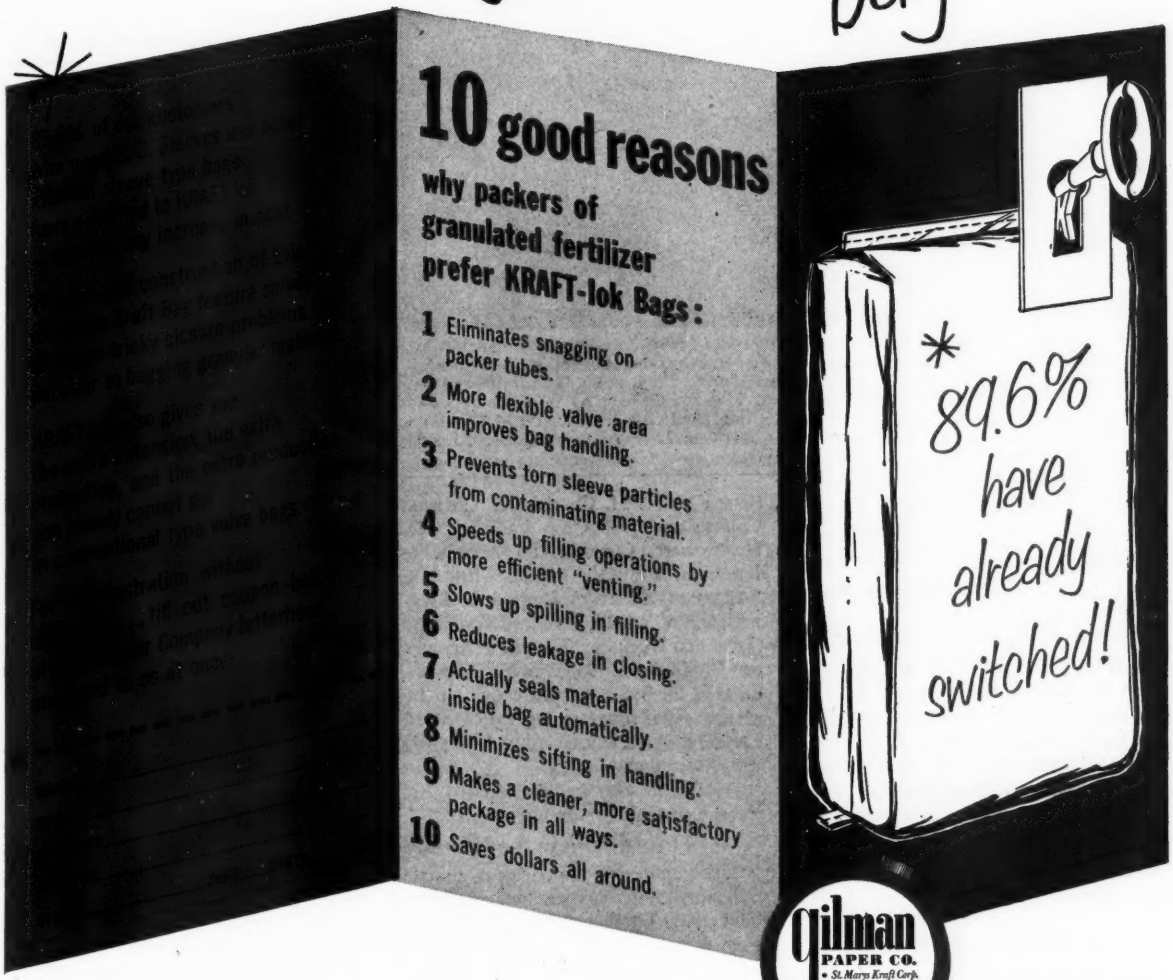
GOING GRANULAR?

switch to KRAFT-lok® bags!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why packers of granulated fertilizer prefer KRAFT-lok Bags:
1 Eliminates snagging on packer tubes.
2 More flexible valve area improves bag handling.
3 Prevents torn sleeve particles from contaminating material.
4 Speeds up filling operations by more efficient "venting."
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9 Makes a cleaner, more satisfactory package in all ways.
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* 89.6% have already switched!

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- St. Marys Kraft Corp.
- Gummed Tape Div.
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1 Responsibility
2 Integrated Plants
3 Generations of Bag Experience

of the Chamber of Commerce, and Frank Sizemore, Tri-State manager.

Vick Chemical co. has announced signing of an agreement whereby it acquired Dr. Hess & Clark, Inc., a producer of pharmaceuticals and feed supplements.

Chemical Construction corp. and **Virginia-Carolina Chemical corp.** have reported that the law suit between the two firms has been satisfactorily settled.

Last February Chemico filed the suit involving a dispute concerning contracts under which Chemico was to design and construct for V-C a triple super plant, sulfur-burning contact sulfuric acid plant and facilities for recovery of uranium phosphate rock at Nichols, Fla.

A one-half interest in Ultra Chemical Works, Inc. has been acquired by **Witco Chemical co.** Officers and management of Ultra will continue as at present.

Associations & Meetings

Iowa Ag Ammonia Officials

Officers and members of the board of directors of Iowa Agricultural Ammonia Distributors. Front row: J. H. Andrew, secretary-treasurer; B. A. Frankl, president; Joe Rowland, Jr., 1st vice president. Back row; Marshall McArthur, Jr., director; W. D. Birdsall, 2nd vice president; Al Kliewer representing Tully Talbot, director; Jerry Jirovsky, 3rd vice president and Barton Bonzer, director. The organization, which has 72 firms as members, met recently in Des Moines to plan an extensive state-wide advertising program.

Bankers Promote Fertility

A new advertising program with soil fertility as its theme is being sponsored by the Pennsylvania Bankers Association.

Mats are being supplied the group by the National Fertilizer Association. Text for the ads was prepared by the bankers association, and NFA supplied the layout, artwork, etc.

NFA is also supplying mats for ads sponsored by the Ohio Bankers Association, and is negotiating with several other bankers groups with a view toward supporting similar programs in their states.

SCPFES Meetings

A series of meetings was sponsored on January 25–28 by the South Carolina Plant Food Educational Society in cooperation with other agricultural agencies in Orangeburg, Hartsville, Columbia and Spartanburg. Talks were presented by R. H. Garrison of Clemson College on "1955 Crop Varieties;" G. H. Stewart, Clemson, on "Profitable Irrigation Projects;" J. B. Pitner on "Agronomy Research Projects in Progress;" H. A. Woodle, leader of Agronomy Extension Work, on "Extension Agronomy Program for 1955;" SCPFES president E. D. Sallenger, Jr., spoke on the society's 1955 program, and the National Fertilizer Association's film, "The Big Test" was shown.

Pest Control Operators Hold Meeting at Purdue

The nineteenth annual pest control operators' conference was held at Purdue University, Lafayette, Ind., on Jan. 31–Feb. 4, according to an announcement from the National Pest Control Association.

Among the topics discussed were the biology of insects, weed control, anticoagulants, hazards related to chemicals used in insect control and rodent control in the grain sanitation program.

Third Cal. Fert. Conf.

The third annual California Fertilizer conference will be held by the Soil Improvement committee of the California Fertilizer Association on the Davis campus of the University of California's College of Agriculture on Tuesday, April 26.

At the morning session the motion picture "California Grows with Fertilizer," which was produced by CFA's Soil Improvement committee and the National Fertilizer Association, will be shown.

Panel discussions concerning pasture and forage, vegetables, deciduous and citrus fruits and field crops will be presented during the afternoon. Speaker for the banquet, which will be held in the Rodeo Room, Hotel El Rancho, West Sacramento, has not as yet been announced.

Conference chairman J. H. Nelson has announced that overnight accommodations can be arranged through the university for rooms in the dormitory on the campus.

New Leaflet by NFA

A leaflet for Missouri, recently published by the National Fertilizer Association, is the fifteenth in NFA's fertilizer usage leaflet series. Other areas which the series has covered include Arkansas, Georgia, Indiana, Kansas, Kentucky, Louisiana, Maryland, New Jersey, North Carolina, Ohio, Pacific Northwest, South Carolina, Tennessee and Virginia.

Colo. Applicators' School

Workers of the Civil Aeronautics Administration, USDA and Colorado Department of Agriculture were scheduled to address the Aerial Applicators' School, Feb. 7 and 8, at Colorado A & M College, Fort Collins, Colo.

Two panel discussions were on the program—"How Can We Improve Operations Under the Colorado Aerial Applicators' Act?" and "What Will Make for a Progressive Colorado Aerial Applicators' Program in 1955."

TSA Annual Convention

On Feb. 6–7, the Tennessee Seedmen's Association met at the Andrew Jackson hotel in Nashville for its annual convention. On the program were talks by L. C. Jacobs, superintendent, Feed, Seed and Fertilizer, "Seed Control;" Webster Pendergrass, "Pasture and Forage Crop Production;" committee reports and a round table discussion titled "Our Problems." Buford Ellington, Tennessee commissioner of agriculture was scheduled to speak at the banquet.

First Miss. Insect Control Meet

By Tommy Wilkerson
Assistant Extension Editor
Mississippi Extension service

POOR planning, unfavorable weather and undependable applicators were named as major causes of insect control failures at the first annual insect control conference at Mississippi State College during January.

A panel, composed of J. F. White of Shell Chemical co. at Jackson, Miss., moderator; Hayes T. Farish, county extension agent at Tunica, Miss., S. L. Calhoun of Agricultural Chemical co., Greenville, Miss. and O. T. Guice of the Mississippi State Plant Board at State College, discussed this subject before more than 200 entomologists, insecticide dealers and applicators from the southeastern states.

Extremely high temperatures and high winds reduced the effectiveness of both dust and spray applications last summer, it was pointed out. The high temperatures reduced the lasting effects of the spray materials, while high winds prevented proper application of dust insecticides.

Unscrupulous applicators, especially "fly-by-night" airplane dusters and sprayers were named as another cause of insect control failures. To correct this it was recommended that farmers should hire only known pilots or companies, either those residing within the state or regularly doing business in the state, not with the "here today, gone tomorrow type."

The conference also featured talks by noted entomological authorities.

Dr. E. F. Knipling, in charge of Entomology Research Branch, USDA, stated that new insect problems call for new insecticides and new methods of application.

He predicted "almost unlimited possibilities among organic compounds for materials that are highly effective against insects, yet of low hazard to warm-blooded animals."

Other panels and talks included information on small grain and pasture insects and their control; livestock insects and their control; vegetable insects and controls; household insects and controls; regulations governing containment of insects such as the pink bollworm, white fringe beetle and sweet potato weevil; the relation between research, extension and industry; application, methods and problems and cotton insects and controls.

Herman Johnston of the Forest Insect Research Branch at Gulfport, Miss., discussed the Federal program in regard to research in his field.

Officers of the Mississippi Entomological Association for 1955 are L. C. Murphree of Coahoma Chemical co., president; W. R. Smith of Shell Chemical co., vice president; Roy Bailey of General Chemical div., secretary. Directors are Dr. M. E. Merkl of the Entomological Research Branch at the Delta Branch Experiment Station, David Young of the State Plant Board and J. C. Redd of Redd Pest Control.

Panel moderators were Dr. Merkl, Si Corley, Msssissippi commissioner of agriculture; A. H. Jackson of Superior Termite co., substituting for Redd; Norman Downey of Hercules Powder co.; Glen Vanderford, associate county agent at Greenville, Miss.; Murphree and H. R. Johnston.

Louisiana Fertilizer Clinic

A fertilizer clinic was sponsored by the Louisiana Plant Food Educational Society in cooperation with the Louisiana State University's College of Agriculture on Jan. 5 at the Zigler Hotel, Jennings.

Chairman was E. R. McCrory, district agent, LSU Extension Service, Baton Rouge.

Henry Heads Sales Group

John F. Henry, Adams-Henry Chemical co., has been elected president of the Salesmen's Association of the American Chemical Industry, Inc.

The association also named E. L. Collins, Chilean Nitrate Sales corp., its vice president; V. L. Rebak, Grace Chemical co., treasurer; and R. J. Roberts, Emery Industries, Inc., secretary. Directors include R. L. Williams, Givaudan Delawanna, Inc.; S. B. Scott, Wyandotte Chemicals corp.; H. B. Clark, Diamond Alkali co.; R. H. Kampschulte, Celanese Corp. of America and G. S. Furman, George Uhe co.

Materials Handling Conf.

A conference on materials handling techniques will be held in conjunction with the National Materials Handling Exposition at the International Amphitheatre in Chicago, May 16 to 20.

Clapp & Poliak has made a grant to the American Material Handling Society, sponsors of the conference, to underwrite the expenses of the meeting.

New Design Eng. Show

The Design Engineering Show, to be held at Convention Hall, Philadelphia, on May 31 to June 3, will succeed the Basic Materials Exposition, held previously in New York and Chicago, announced Clapp and Poliak, Inc., producer of the event.

National N Group to Meet

The National Nitrogen Solutions Association, recently organized at Shenandoah, Iowa, will hold its spring convention on March 14 and 15 at the Paxton hotel in Omaha, Nebr.

NNSA president, Wayne R. Johnson, reports that a very excellent program has been developed covering all phases of the nitrogen solutions industry, including handling equipment, storage and applicating equipment. Officers will be elected and a permanent organization set up.

Mosquito Control Reports

About 30 reports relating to mosquitoes and their control are scheduled to be presented at the 42nd annual meeting of the New Jersey Mosquito Extermination Association in Hotel Haddon Hall, Atlantic City, on March 9–11.

Expected to participate are representatives of agencies concerned with mosquito control throughout the US, Canada and abroad.

Fertilizer Society Meetings

A paper on "Nitrogenous Fertilizer Production" was presented by W. K. Hall at the general meeting of the Fertiliser Society (of England) on January 27 in the lecture hall of the Royal Sanitary Institute in London.

On April 21 the society is scheduled to meet with the Institution of British Agricultural Engineers in London to discuss "Problems of Corrosion by Fertilisers."

CHEMICALS

Aerosol Bomb Pack For Blossom Set

Science Products co.'s Blossom Set now is being packaged as an aerosol bomb. The product is said to make tomato flowers set fruit, even when cold nights or hot dry weather prevails. Therefore, Science Products says Blossom-Set is often instrumental in producing ripe tomatoes where normally there would be none at all, or very few, produced.

Retail price for a 12 ounce can containing a season's supply for 100 plants is $1.79.

Chipman Chem's 'Chlorea'

"Chlorea," a combination of sodium chlorate, borate and CMU, has been announced by Chipman Chemical co.

It kills all types of vegetation and has a lasting residual effect to inhibit regrowth, according to Chipman.

Stauffer Announces Vapam (RS 116)

Vapam, a general purpose soil fumigant recently announced by Stauffer Chemical co., controls practically all types of soil-borne diseases, nematodes, growing weeds and weed seeds, as well as certain species of soil infesting insects and related pests, states manufacturer.

Although especially suitable for seed bed treatment, Vapam also shows promise for a wide range of soil problems confronting farmers, nurserymen and home gardeners. Its high solubility in water allows convenient application without special equipment. The fumigant can be introduced into the soil through irrigation equipment, to the plow sole or to the ground surface in connection with use of a rototiller. Stauffer says that with suggested methods of application no ground coverings are required.

Vapam is stable in the commercial concentrated solution, but decomposes rapidly in damp soil to liberate a penetrating gas which dissipates within a few days, and under most conditions, crops may be planted within seven days after soil treatment.

Descriptive literature on Vapam 4S, the formulation which will be offered for sale under experimental permit, will be sent if you circle 116 on Reader Service card.

New Crag Packages

The one-pound home garden package of Crag Herbicide-1 serves a dual selling purpose for dealers. One side aims at initial spring sales for crabgrass use, while the other is directed toward weed prevention in the garden later in the year. The herbicide is produced by Carbide & Carbon Chemicals co.

'See-In' for Rodents

A new device for rodent control has been developed by the Solvit Chemical co., Madison, Wisc. Named Kelly's "See-In" Rodent Cafeteria, it holds one quart of liquid poison and/or six pounds of dry rodenticide.

The device is made of galvanized steel and features an automatic non-clog feed hopper, automatic liquid dispenser and an inspection window for checking on bait consumption.

DuPont 'Delsan' AD

DuPont co. has developed "Delsan" AD Seed Protectant containing "Arasan" seed disinfectant and dieldrin insecticide.

The new insecticide-fungicide seed protectant is recommended for treatment of beans, including limas, seed corn and pea seed.

Its effectiveness in improving stands, states DuPont, has been established by field trials on corn and beans in Wisconsin, New York and Pennsylvania; beans and peas in Michigan; corn in Minnesota and Iowa and beans in Virginia.

Test work shows that the chemical protection will usually increase stands and yields by reducing losses from seed decay and seedling blight caused by many seed-borne and soil-borne organisms.

Delsan AD may be applied as a slurry with a standard slurry treater, or the slurry may be mixed with the seed in a barrel treater or on a floor. It is applied at the rate of 1¼ ounces per bushel of field corn seed, and 1¾ ounces per bushel of sweet corn, bean or pea seed.

Miller Chem. Markets Hy-Tox Fly Bait

Miller Chemical and Fertilizer corp. has reported development of a dry, granular bait that attracts and kills flies, including resistant strains. Marketed under the name Hy-Tox Fly Bait, it has as its active ingredient malathion impregnated into a granular carrier in combination with fly attractors.

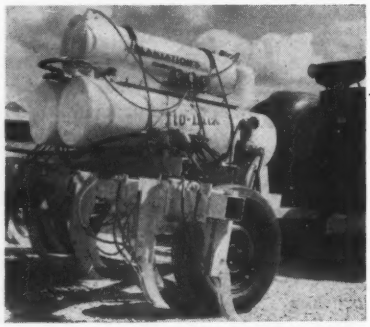
It is packaged in a one pound shaker and a five pound bag.

Equipment & Supplies

Flo-Mix Unit (RS 117)

All three major plant food elements can be accurately regulated and applied in one application with the Flo-Mix liquid fertilizer applicator, reports Plantation Fertilizers corp.

The applicator's forward unit normally carries two 60 gallon tanks of potash solution, a 60 gallon tank for



phosphoric acid, air tank and compressor and a bar blade to which are attached the cutting units. At the rear of each cutting blade are two tubes, one for dispensing the nitrogen-potash mixture, the other for phosphate. Nitrogen is carried on a separate trailer rig.

For more information on this new idea in fertilizer application circle 117 on Readers Service Card.

Siftaire Process for Odor, Fume Removal

Development of an efficient, low-cost process for removing industrial odors and fumes and recovering valuable vapors from plant exhausts has been announced by Chemurgic Process corp.

Called Siftaire, the process makes use of the lung-protecting principles of the gas mask and represents the first practical industrial application of activated carbon for cleaning hot, wet exhausts and recovering costly vapors while permitting simple, inexpensive regeneration of the carbon, stated the company's president, Herbert B. Larner.

New American Tractors

Twelve new 1955 models of crawler tractors, attachments and trailers as well as a low-cost lease-purchase plan are being announced in a series of Tractorama shows throughout this country and Canada by factory-distributor branches and dealers of American Tractor corp.

For information on numbered items use the Reader Service Card

New Safety Suits (RS 118)

Two new styles of MSA decontamination safety suits are described in a bulletin just issued by Mine Safety Appliances co.

The MSA chemical type decontamination suit is made from a flexible butyl-fairprene material and offers protection against nitrobenzene, nitrotoluene compounds and aniline. Dehumidified air, cooled or heated, is supplied to both suit and hood through a combination hose and safety cable entering the suit through its back.

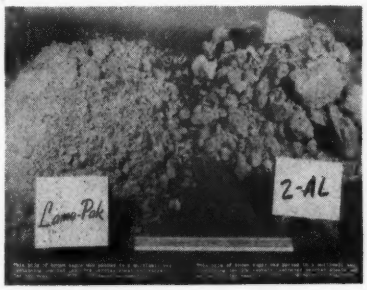
Similar in design to the chemical type suit, the MSA acid type decontamination suit is made of neoprene-fairprene fabric and offers protection against light concentrations of acids.

For a copy of the bulletin, circle 118 on Reader Service card.

Lamo-Pak (RS 119)

Arkell & Smiths is now introducing a new moisture-barrier sheet, Lamo-Pak, to all industries whose packaged products are affected negatively by changes in moisture content. The newly-developed laminate is sandwiched between two sheets of light weight kraft.

Recent tests run by an independent laboratory show that Lamo-Pak is up to twice as effective as a moisture barrier sheet as asphalt laminated kraft, states the manufacturer.



The material is said to be odor-free, more economical, have less stiffness and in a multiwall bag closure operation will not cause sewing needles to gum, thereby allowing a smooth, trouble-free packaging operation.

Samples of the new moisture-barrier sheet may be obtained by circling 119 on Reader Service card.

Ross Change Can Mixer

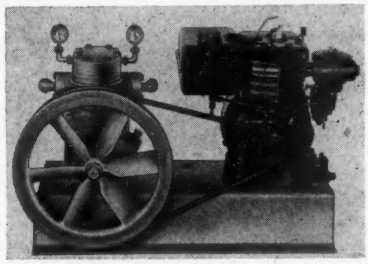
Charles Ross & Son co. has developed a new No. 30 DM double motion change can mixer designed to mix the heaviest materials more thoroughly and in less time than previous types of change can mixers.

The company says greater effectiveness of mixing action is due to the double planetary type stirrer action. Each stirrer revolves on its own axis and, in addition, both stirrers are revolved at a slightly slower speed around the entire inside of the mixing can.

The No. 30 DM is available in 20, 60 or 80 gallon production sizes.

NH_3 Vapor Pump (RS 120)

A vapor pump for transferring anhydrous ammonia from storage tanks to mobile tanks, and from mobile tanks to



applicator tanks without transfer loss is now available, says D. H. Krug co., the manufacturer.

The pump is small and completely portable and works on the same principles that large bulk plants use in unloading tank cars.

It can be used with gasoline engine—¼—½—¾ h.p. electric motor, or just the compressor which is available for use with your own source of power. Capacity is 1.6 to 3.5 cubic feet per minute.

For more information, circle 120 on Reader Service card.

Changeroom Design Book

A complete 40 page study covering design of changerooms with overhead lockerbaskets has been published by The Moore co.

The design file sets forth standards to be maintained in toilet, shower and locker rooms for maximum sanitation, efficiency and economy and furnishes details for laying out locker rooms with lockerbaskets.

A free copy of the file may be obtained by writing to The Moore co., 1036 Quarrier St., Charleston, W. Va.

Epoxy Coatings (RS 121)

Perma-Skin Epoxy Coatings are based upon the use of catalysts to provide, in an air-dry system, properties previously obtainable only with high-temperature baking, according to Dennis Chemical co.

This permits coating of items too large or otherwise impractical to bake.

The coatings have excellent adhesion, abrasion resistance, toughness, flexibility, acid and alkali resistance and solvent resistance, Dennis reports.

For complete data covering properties and application, circle 121 on the Reader Service card.

Teflon Spray Nozzles

Bete Fog Nozzle Inc. says its new line of Teflon spray nozzles are nonclogging, corrosion resistant with practically any spray, long-wearing and inexpensive. Called the "TF" series, the nozzles are available in 10 models with narrow angle (50°) or wide angle (120°) hollow cone spray pattern in five different flow rates from 5 to 50 gpm. They are threaded with ⅜" or ½" male pipe thread.

C&E Ag Chem Bulletin

A bulletin is available from Crippen & Erlich Laboratories, Inc. entitled "Agricultural Chemicals" which lists prices for analyses of insecticides and fungicides for sampling and inspection of herbicides, rodenticides and other agricultural products and for special services. For a copy, write to Crippen and Erlich, 1138 E. North Ave., Baltimore 2, Md.

Bind-It-Yourself Book

A new booklet showing how offices can bind their own catalogs, presentations, booklets, etc., in beautiful, colorful plastics for about one cent per book, depending on size and quantity, is available from Tauber Plastics, Inc., 200 Hudson St., New York City 13.

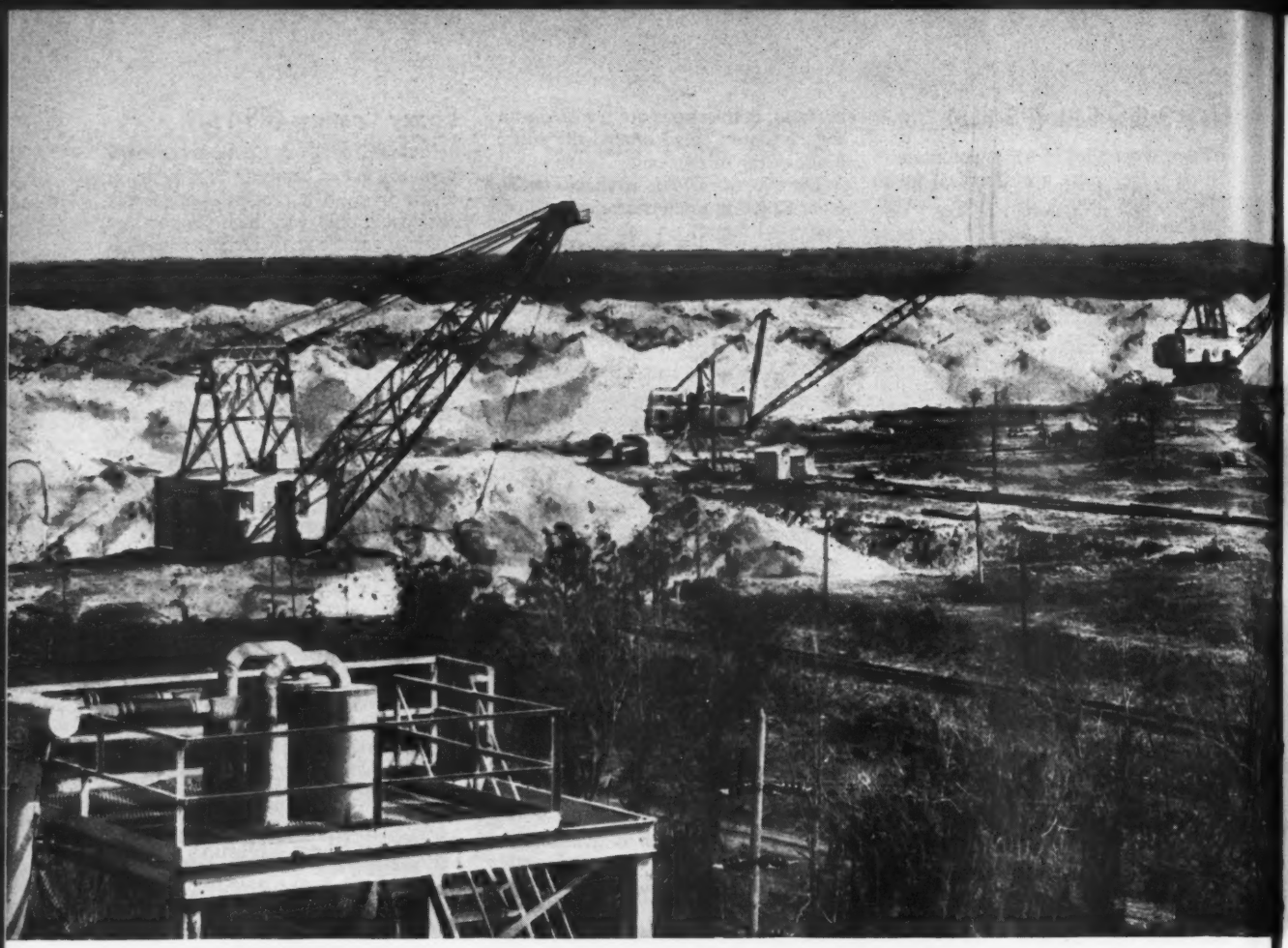
Suppliers' News

Fulton Bag and Cotton Mills reports that "Square Dance" cotton print feed bags will soon appear in feed stores from coast to coast. Two designs show a Western influence of cowboys, cactus and square dancing couples, created for use in making men's and boy's shirts, while others are definitely feminine with bright colors, flowers and border prints.

Three new distributors have been appointed by **O. W. Kromer co.**—Seitz Distributing co., Billings, Mont.; Smalley Mfg. co., Manitowac, Wisc. and Eastern Machinery co., Syracuse, New York.

Production has started at **St. Regis Paper co.'s** new multiwall paper bag manufacturing plant at Franklin, Va. Located on a 21-acre site, the new plant replaces the one formerly leased from Camp Mfg. co. Facilities of St. Regis's plant provide about 152,000 square feet of space and include four bag manufacturing lines, complete printing and engraving equipment, machine shop, paper and bag storage areas and general office space.

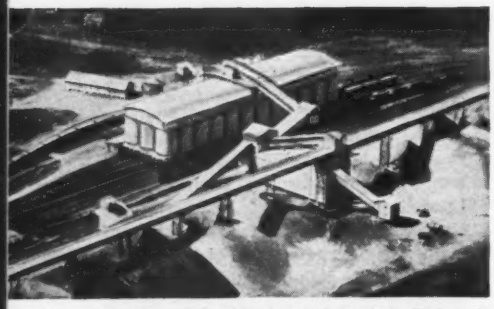
For information on numbered items use the Reader Service card



Three of the A.A.C. Co's electrically-operated draglines at work at our phosphate mines in Central Florida. Bucket capacities range from 9½ to 17 cubic yards. The 17-yard draglines with their 175-foot booms each weigh more than a million and a half pounds and can move 35,000 tons of material in 24 hours. From these rock deposits flow a continuous stream of high quality phosphate rock, assuring a dependable source of supply of AA QUALITY phosphorus products, see list below.

AA Quality...

for over 85 years a symbol of quality and reliability



From the air—wet rock storage and drying plant, with dry rock storage silos in background. These silos, 29 in number, have a total capacity of 40,000 tons of dried rock. Under the silos are four runways where 40 railroad cars can be loaded at a time.

principal AA QUALITY products

All grades of Florida Pebble Phosphate Rock
AA QUALITY Ground Phosphate Rock
All grades of Complete Fertilizers **Superphosphate**
Gelatin **Bone Products** **Salt Cake** **Ammonium Carbonate**
Sulphuric Acid **Fluosilicates** **Insecticides and Fungicides**
Phosphoric Acid and Phosphates
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THE AMERICAN AGRICULTURAL CHEMICAL COMPANY

GENERAL OFFICE: 50 CHURCH STREET, NEW YORK 7, N. Y.

30 FACTORIES AND SALES OFFICES, SERVING U.S., CANADA AND CUBA—ASSURE DEPENDABLE SERVICE

Washington Report

By Fred Bailey & John Harms

The government is not likely to put wheat production curbs on a bushelage basis rather than on acreage, despite present Agriculture department studies along this line. Secretary Benson has asked the National Agricultural Advisory Commission to study the merits of bushel controls, but informed Washington opinion believes the odds are against them. It's an old idea, often recommended, but so far has never found acceptance among government farm men.

Some different approach to the wheat surplus problem may be recommended by the USDA this year. The wheat surplus is our biggest agricultural headache at this time. But the trend is toward such things as changing the grades of wheat, limiting of price supports to certain high qualities of grain . . . and keeping present acre controls.

If, however, bushel limitations are imposed, the fertilizer industry as well as others serving agriculture would be affected. Just what the effect would be on sales, however, is a point of disagreement among fertilizer experts.

Some officials of the National Fertilizer Association, who, incidentally, don't look for bushel controls to be imposed, believe fertilizer use would be hurt. While in themselves such controls would not tend to cut back fertilizer use, farmer psychology may turn against using more fertilizer on wheat as a cost-saving device.

If such controls are imposed, farmers would be permitted to market a given quantity of wheat, but there would be no acreage limitation. Farmers might figure that they can produce their marketable quota without too much effort, or fertilizer, and may not feel the need for higher per-acre yields.

Another school of thought believes that bushel controls would make no change in fertilizer sales. This is based on the assumption that farmers would still want to raise as much wheat per acre as they could.

The 1955 outlook for chemical production and sales is extremely rosy, according to the Business and Defense Services Administration. Sales are forecast at an all-time high of $21 billion.

BDSA's Chemical & Rubber division report for January forecasts that US chemical and allied products sales this year will top the 1954 high by about 4 per cent. Chemicals production also is expected to move up 4 per cent. Keener competition is foreseen . . . due to further available capacity from new plants.

Fertilizer consumption during the 1954–55 year is expected to set a new record level this spring.

Marketing of new pesticide products indicates increased production and use, the government says.

Other increases expected: Elemental sulfur and sulfuric acid are expected to hit new peaks with 6 million long tons and 14 million short tons respectively. Chlorine output is expected to be about 10 per cent greater than 1954. Phosphorus and phosphatic chemicals will be marked by continuing heavy demand and some increase in productive capacity.

Domestic potash producers may get relief from reported "dumping" in this country of European muriate of potash. But odds were only slightly better than 50–50. The Tariff Commission is scheduled to make its final report to the Treasury department on recent hearings covering potash originating in the Soviet Zone of

Germany by Feb. 24. A report on imports from Western Germany and France is to be made by March 5.

The hearings stemmed from the Treasury department's findings in November that muriate of potash from those sources was being sold here at less than "fair" market value.

If the Tariff Commission finds that US potash producers are being hurt by these imports, anti-dumping import duties will be applied. The potash hearings are the first held by the Commission under the Anti-Dumping Act.

East German imports threaten domestic producers with a market loss of $2.5 million annually, according to testimony by Paul Speer, vice president of the United States Potash co., of New York. Speer also pointed out that railroads moving potash from the main supply sources in New Mexico to Eastern markets stand to lose about $2 million each year. Speer says domestic muriate of potash sales in 1953 totaled $56 million.

Conservation payments (ACP) will be untied from crop controls, according to present indications. The Agriculture department has endorsed, and the Agriculture committees of both Houses of Congress are going along with a measure to repeal the Holland amendment to the 1954 Farm Act which bans ACP payments to farmers who over-plant their acreage allotments.

Cotton acre allotment increase now seems probable . . . with only the size of the increase in doubt. Best information now is that the increase will be held to within 400,000 to 600,000 acres above the 18.1 million-acre 1955 allotment. This will be mostly for small farmers . . . and some hardship cases.

Wheat legislation may be heavy this year. A bill to remove planting restrictions on durum wheat in Montana, Minnesota, North Dakota and South Dakota already is law. A bill to cut 20 states out of the "commercial wheat area" this year, passed only by the Senate last year, has a good chance of a congressional okay. Another to permit growers of wheat for their own feeding use to escape production controls also has a better than even chance.

Repeal of flexible price supports now is given an even chance of getting House approval. Cloak room strategy is to get House passage of 90 per cent supports for basic this year, then push for Senate approval in the politically-sensitive atmosphere of 1956.

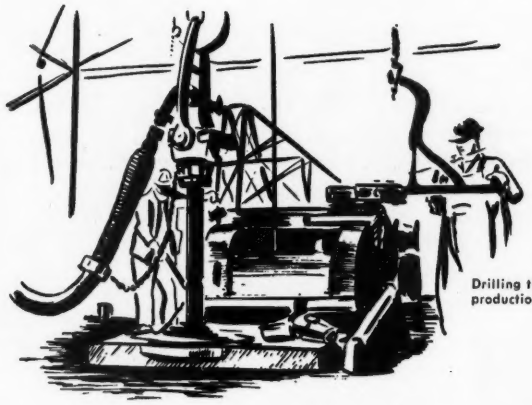
Chemical additives to foods. Chairman J. Percy Priest of the House Interstate Commerce committee has sponsored a bill (HR 4099) to ban the use in food of new chemical additives "which have not been adequately tested to establish their safety." Sponsorship by Priest assures the bill an early hearing and probably favorable action by the committee.

Sensational claims are being made for a new pesticide chemical discovery—DDVP. Its discoverers, chemists of the U. S. Public Health Service, believe this pesticide eventually will become the answer to insect resistance to DDT. It is said to be more potent in killing insects and less toxic to humans and farm animals than many modern economic poisons.

Discovery of DDVP—dimethyl dichloro vinyl phosphate—opens up a whole new class of economic poisons, officials say, because it comes from a chemical family not previously considered as substitutes for DDT and related compounds.

Potency of this organic phosphorus insecticide was illustrated in a large dairy barn where there was a high fly population known to be resistant to DDT. The flies were reduced to nearly zero in less than four hours by eight grams of DDVP, where it was estimated it would have taken 10,000 grams of DDT.

Only one company, Montrose Chemical co., of New Jersey, was engaged in manufacturing DDVP at press time, and only for "pilot test" purposes. Public Health officials estimated the first commercial lot of DDVP would go to market some time in early fall. Price was expected to be competitive with DDT.



Drilling the production wells

Crude Sulphur

for Industrial Use

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Texas Gulf Sulphur Co.

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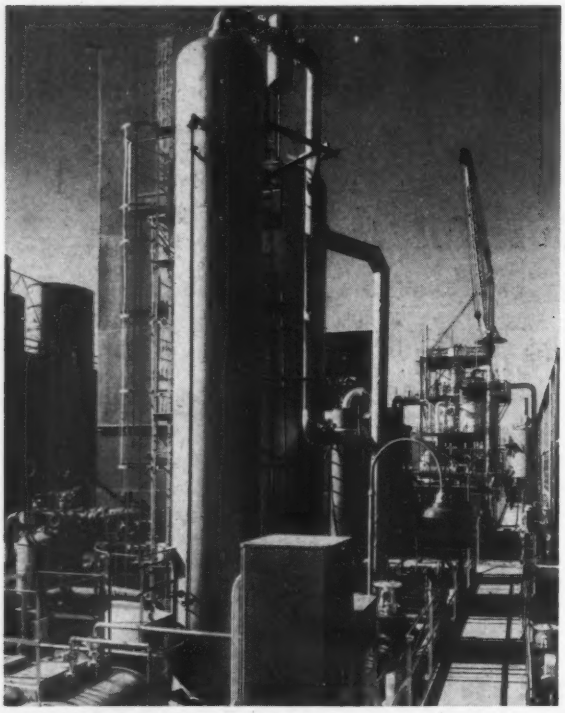
Producing Units

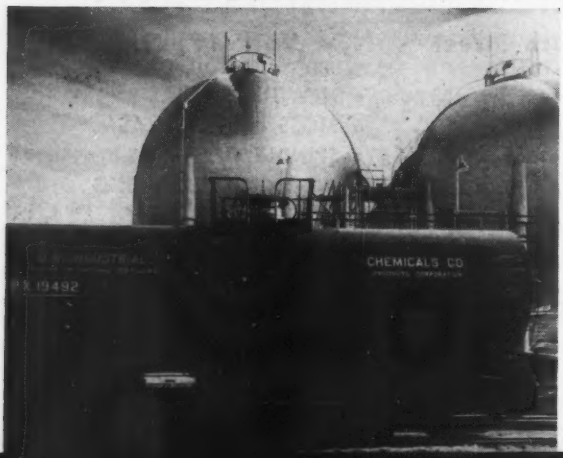
- **NEWGULF, TEXAS**
- **MOSS BLUFF, TEXAS**
- **SPINDLETOP, TEXAS**
- **WORLAND, WYOMING**

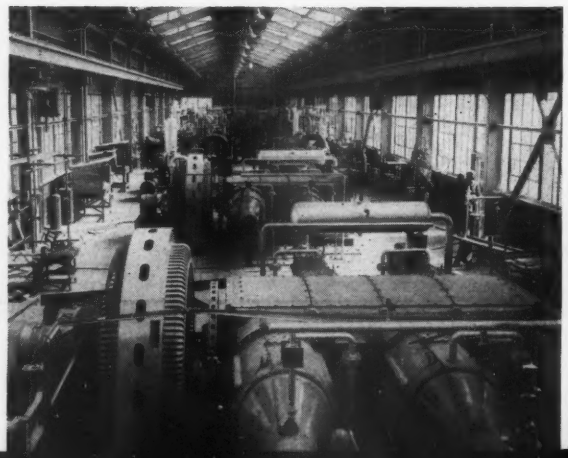
Tuscola Plant Dedicated

TUSCOLA, ILL. was the scene of the latest in the recent series of dedication ceremonies for new nitrogen facilities as the $7 million plant of US Industrial Chemicals co. was formally opened. The works was termed another step toward the parent (National Distillers Products corp.) company's goal to be among the leading US chemical producers by 1960.

On hand to accept the first tank car of anhydrous ammonia were C. R. Ware, president, S. L. Victor, secretary-treasurer and Percy C. Stackhouse, vice-president-general manager of Central Illinois Fertilizer co. of Tuscola. The release was witnessed by government, industry and agricultural officials.







K. D. Jacob Was Main Speaker

Principal speaker at the affair was USDA's Dr. K. D. Jacob who reviewed the importance of fertilizer nitrogen to midwestern agriculture.

Representing USI and National Distillers Products were John E. Bierwirth, president; Dr. R. E. Hulse, vice president and director of the chemical divisions; Roy Coppedge, vice president; L. A. Keane, vice president, USI; Warren Johnson, manager of chemical sales and Lawrence C. Byck, Jr., assistant to Johnson.

Both the ammonia plant and a sulfuric acid unit that came on stream in September, 1953, were located at Tuscola to integrate with National Petro-Chemicals corp., a joint venture of National Distillers and Panhandle Eastern Pipeline co.

By-Product Hydrogen Available

An important advantage enjoyed by the USI plant is the availability of by-product hydrogen flowing from Petro. Natural gas from Panhandle is used for production of Petro ethyl alcohol, ethyl chloride, ethyl ether and polyethylene.

Spent sulfuric acid from the alcohol unit is returned to the USI acid plant in one phase of the integration, and oxygen released in the air-separation process has several captive uses at both the USI and Petro plants.

Production capacity of the ammonia plant will be 50,000 tons per year of anhydrous. Facilities are included for conversion of a portion of the ammonia to nitric acid for producing ammonium nitrate, which in turn is used to manufacture nitrogen solutions. ◆

LEFT: Liquefaction facilities are in the foreground, catalytic converter structure and ammonia synthesis area in right background. LOWER LEFT: Storage spheres and USI tank car. BELOW: View of compressor house.

"The hands unload them rough"

—says Fred Schroer, Jr. of Valdosta, Ga.

"I've never seen a thread give under this pounding and believe me, if they weren't tough burlap bags, we'd have a heavy loss over the years from waste."

Fred should know. He and his brother, Herbert, now run the 1200-acre farm of their father, Fred W. Schroer, retired Master Farmer and pioneer in the modern agricultural age of South Georgia. Mr. Schroer says he's been using burlap bags since 1912 and, "During the years, I've had less trouble with burlap bags than any one thing I use. First thing I did this year was put in our fertilizer order—in burlap bags, of course. You can't beat them—no matter how you try or what you use."

That's a strong statement from such an outstanding farmer, but typical of what farmers all over the country tell us. Burlap bags are *preferred* by farmers.

Just ask your own customers—

they'll tell you that burlap

Is strong — takes dragging, dropping, *man-handling* — any tough job on the farm.

Gives good ventilation — keeps farm supplies and products fresh.

Laughs at sudden showers — wetness or dampness can't weaken it.

Saves money — extra value from re-sale and re-use.

Saves storage space — stacks to any height without slipping.

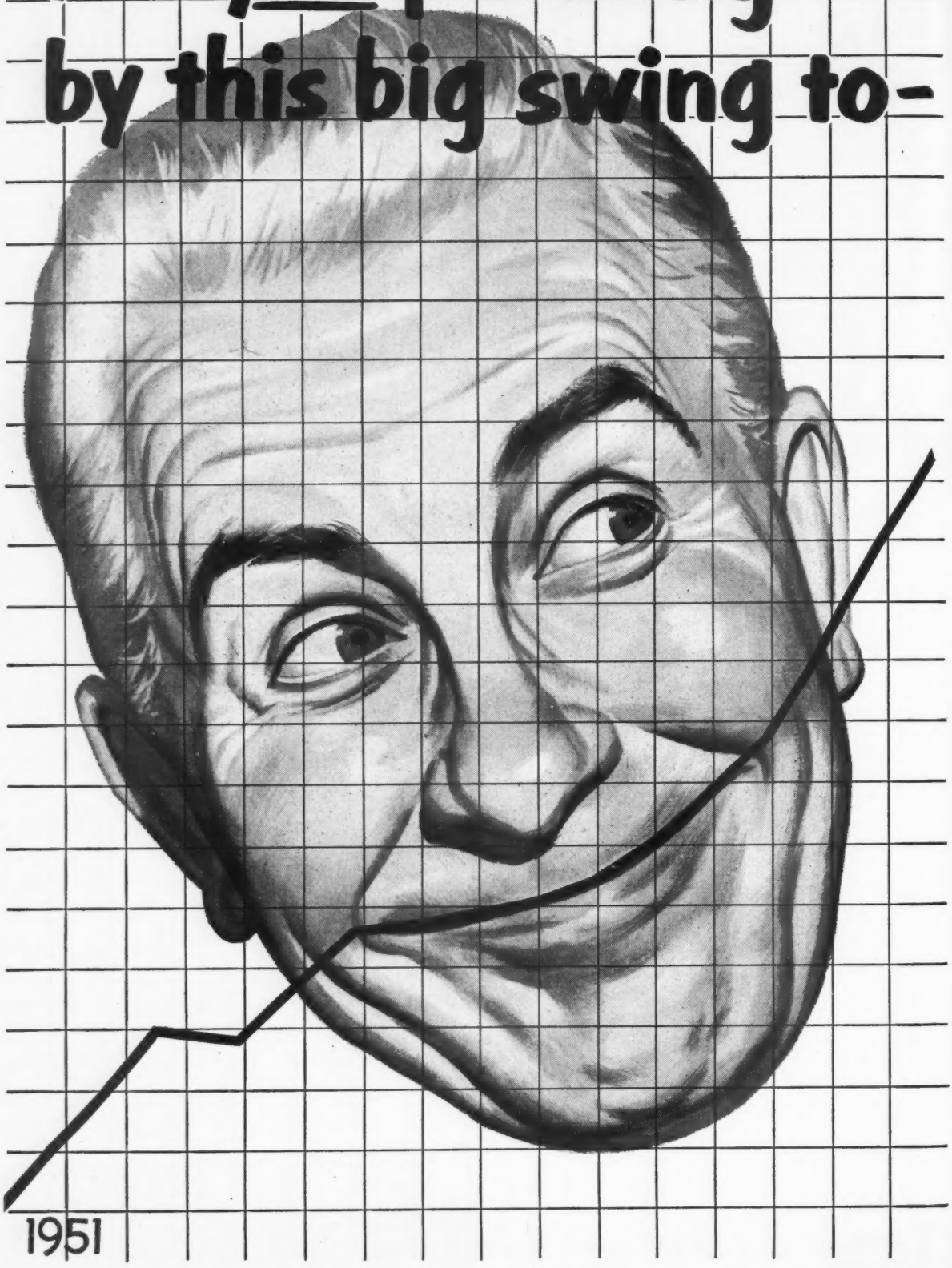
Has 1000 uses — always in demand on the farm (popular with farm wives, too!)

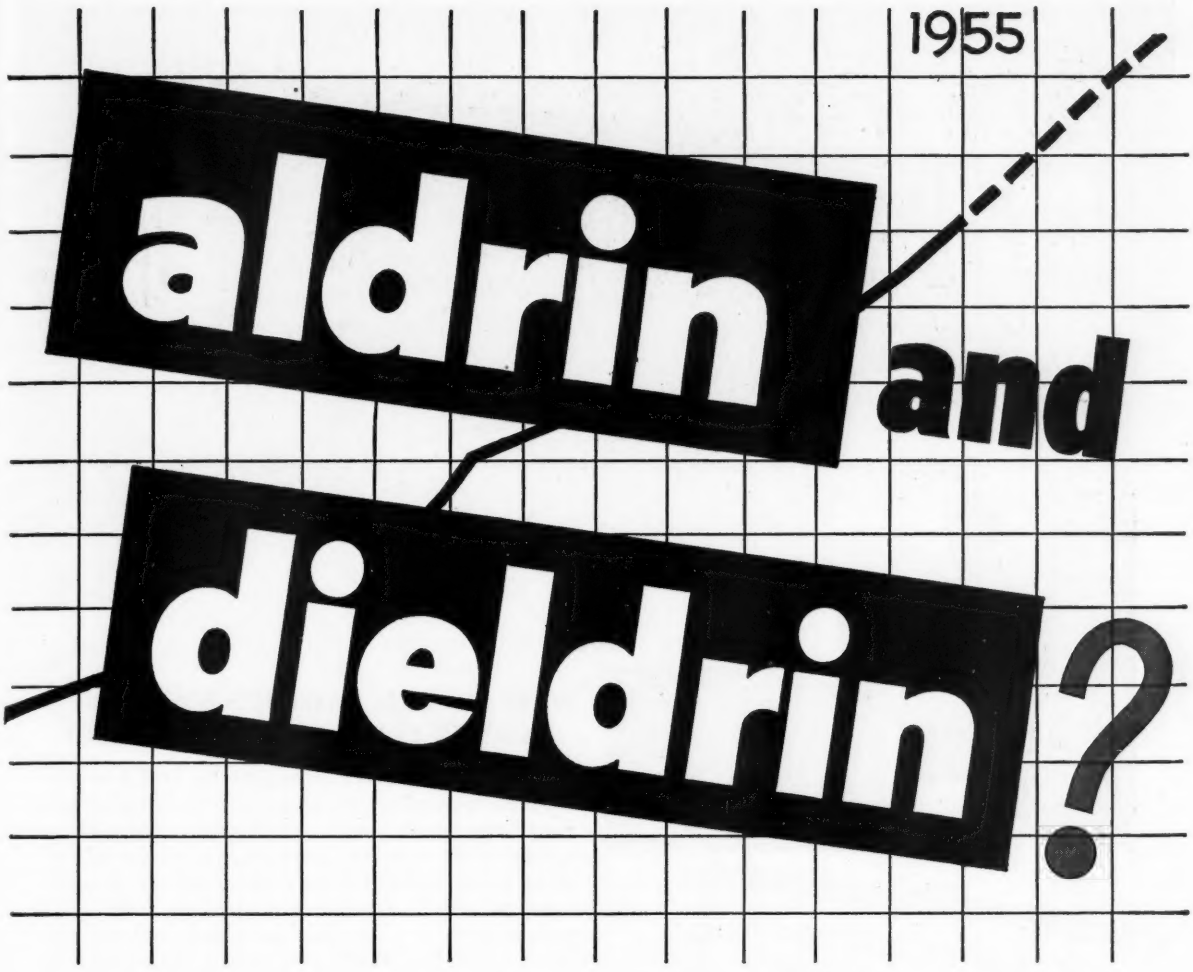
THE BURLAP COUNCIL

of the Indian Jute Mills Association

155 East 44th Street, New York 17, N. Y.

Are you profiting by this big swing to-





IN AN AMAZINGLY SHORT TIME the sales of aldrin and dieldrin have skyrocketed! There's a good reason! Both of these powerful insecticides have proved to be top controls for many kinds of crop pests . . . and constant research keeps uncovering more and more uses all the time.

Aldrin gives fast, dependable control of pests that infest corn, cotton, peanuts, wheat, barley, rye, oats and tobacco. And aldrin is recognized internationally as the Number 1 hopper stopper.

Dieldrin, aldrin's insecticide twin, famous for its long residual action, gives outstanding control of pests that attack cotton, turf and lawns, vegetables, fruits, cereal and forage crops. And—dieldrin is tops for public health pests, indoors and out.

You'll find both aldrin and dieldrin make up readily as dusts, wettable powders, emulsible concentrates and granules . . . all common formulations.

• • •

Shell field representatives are working constantly with growers, county agents, extension entomologists, and state and federal research workers to determine the needs of the growers and what type formulations best apply. Information of this nature is passed along to formulators by Shell representatives. Also, powerful advertising, at the right time, helps you make more sales right in your area.

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AGRICULTURAL CHEMICALS DIVISION

Chemical Partner of Industry and Agriculture

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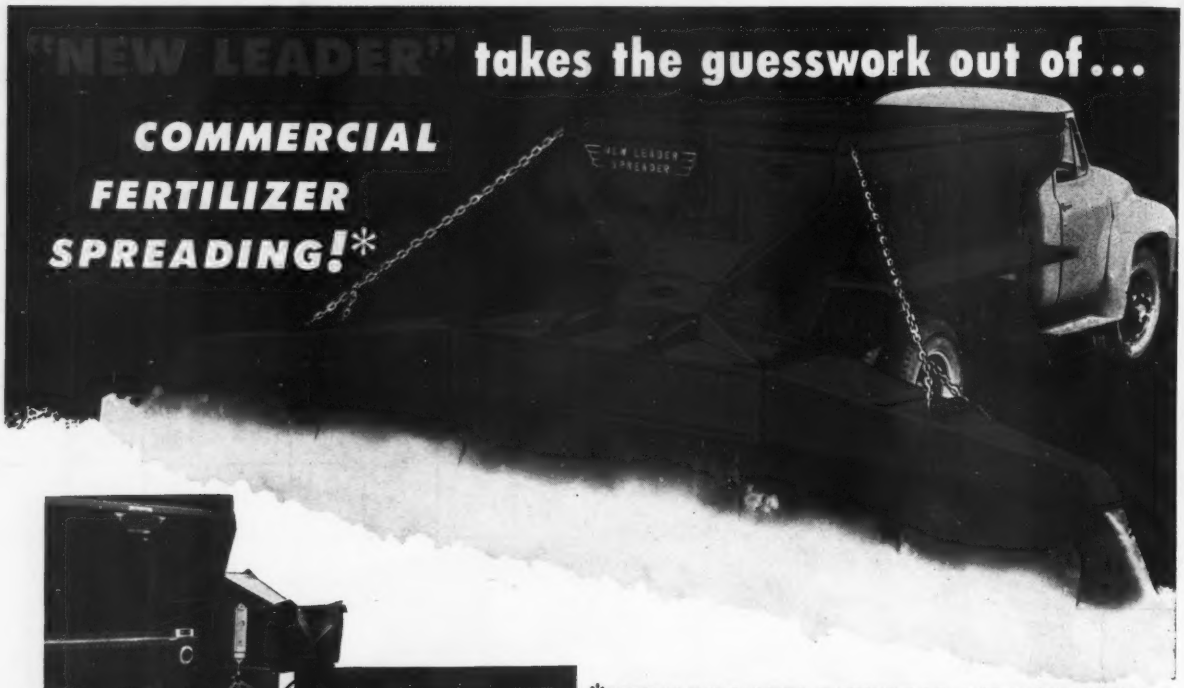
"NEW LEADER" takes the guesswork out of...

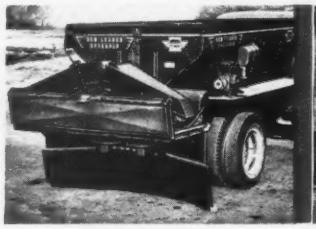
COMMERCIAL FERTILIZER SPREADING!*



*NEW LEADER METERING ATTACHMENT ASSURES EXACT SPREAD PER ACRE!

Here's another *New Leader* engineering first! A simple, foolproof mechanism—the *New Leader* Metering Attachment takes all guesswork out of commercial fertilizer spreading. By accurately measuring the amount of fertilizer being fed to the twin distributor discs, correct feedgate settings are obtained. Accurate metering of spreads of from 100 pounds per acre up are assured. This is a feature beneficial to fertilizer manufacturers, suppliers, custom operators and farmers alike.

Motor-driven twin distributor discs and drive-shaft driven conveyor is the answer to the most accurate truck mounted spreader in the world.



COMBINATION SPREADER (with Hood in Road Travel or Lime Spreading Position)
Set the feedgate, drive straight and you can't miss getting an accurate spread. Conveyor is geared to ground speed assuring an accurate flow of material. The twin distributor discs are powered by a separate auxiliary engine, which assures you of a constant width of spread, regardless of the speed of the truck.

NEW LEADER LIME SPREADER
Twin distributor discs, 24" wide conveyor and large feedgate opening eliminates bridging of material and assures accurate, more even spreads.

"NEW LEADER" Self-Unloading Transports deliver more materials FASTER . . . AT LESS COST!

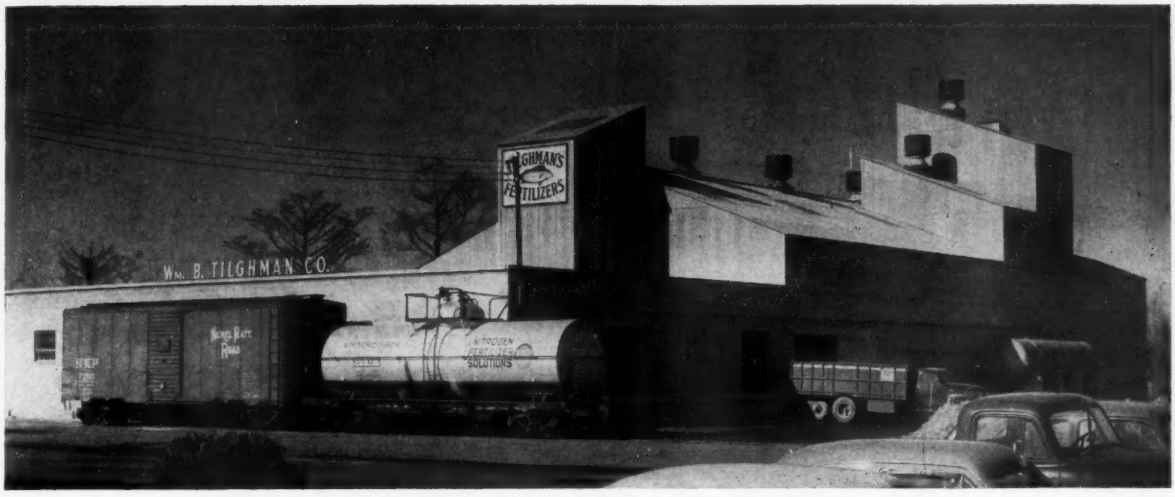
Write today for information and prices

Here's one sure way to increase your tonnage and prolong your season by providing commercial fertilizer in bulk to your dealers! The NEW LEADER Self-Unloading Bulk Transport giving your dealers bulk delivery of fertilizer when and where they want it. In addition to mixed goods the NEW LEADER Self-Unloading Bulk Transport can be equipped to haul bagged materials when necessary. Many companies recognize this method of distribution and find that it has reduced many problems such as storage, extra inventory, etc.

Write, Phone or Wire today for complete information, specifications and prices!

HIGHWAY EQUIPMENT CO., Inc.

MANUFACTURERS OF THE WORLD'S MOST COMPLETE LINE OF SPREADERS AND BULK DELIVERY EQUIPMENT



Open New Tilghman Plant

SEVERAL hundred persons were expected to attend the official opening of the Wm. B. Tilghman company's modern new fertilizer plant at Pocomoke City, Md. The guests were conducted on a tour of inspection by Col. Wm. B. Tilghman, Jr., president of the company, and other officials.

Following the inspection of plant facilities, guests were served a barbequed chicken dinner. In extending an invitation to the open house, Col. Tilghman said:

"In the 13 months since the disastrous fire of November, 1953, which completely razed our Pocomoke plant, our every thought has been directed toward increasingly better service to our customers through the construction of a modern and efficient manufacturing plant. This, then, is the result of our planning, our energies and our resources. We feel proud of our accomplishment here."

Equipment and Construction

Embodying the latest advances in mechanical equipment and construction materials and methods, the new plant is 95 feet wide and 210 feet long, incorporating a complete conveyor system.

Walls of the building are of reinforced concrete and the roof, of corrugated asbestos around a structural steel frame. All bin partitions are of book-shelf construction designed to keep all lateral pressure from the walls.

The operating aisle extends down the center of the building on the first floor, and bulk raw materials are unloaded at each end of the plant—from boats on the north and from railway cars at the southern end.

A bucket elevator lifts materials to a fixed belt conveyor which delivers to the various bins. Along one side, at the center of the plant, is a six compartment hopper system with one weigh scale.

Weighted batches discharge by gravity to the first elevator of a one ton mixing unit. After blending and ammoniation with nitrogen solutions the mixed goods are taken up by a second elevator and carried by belt conveyors to storage bins.

The bagging unit consists of an elevator screen and tailings mill for bagging in either 80 pound multiwall or 167 pound burlap bags. Bagged goods are delivered by conveyor directly to delivery trucks.

Designed by F. N. Strudwick, staff engineer, to conform to the firm's local operation, the plant is termed the most modern of its type. Wherever possible, local contractors were brought into the picture providing the structure, roofing, electrical facilities, some conveyors, signs and other items.

Suppliers

The Stedman Foundry & Machine co. designed and furnished the production system, and steel was supplied by Dietrich Bros., Baltimore, Md. Other companies furnishing production equipment included the Oliver corp., some conveyors; Inglett & Corley, bagging machine; Howe Scale co., scales; Old Dominion Iron & Steel corp., steel measuring tank and fittings and Tidewater Supply co., glass tubes and valves.

Officers of the company, in addition to Tilghman, include Louise T. Lambert, vice president; Ralph A. Ross, vice president and manager, Pocomoke plant; John L. Morris, secretary-treasurer; F. Nash Strudwick, assistant secretary-treasurer and staff engineer and Edward H. Smith, sales manager. ◆

Mineralized FERTILIZER!

THE *Easy Way* TO HAVE A COMPLETE PLANT FOOD

With Tennessee Custom Formulated Mineral Mixtures — It's easy to have a completely mineralized fertilizer. We custom mix any combination of minerals to your own specifications — There is only one ingredient to add to your regular fertilizer for a completely balanced plant food — No additional labor or mixing facilities are required since Tennessee Custom Formulated Mineral Mixtures come to your plant — in bulk or bag — already carefully mixed in controlled amounts of soluble, readily available forms of Copper, Manganese, Iron, Zinc, Magnesium and Boron. With a Tennessee Custom Formulated Mineral Mixture — you cut down on raw material cost, number of items purchased and handling time.

Samples, specifications and detailed information available upon request.

TENNESSEE TC CORPORATION

TENNESSEE CORPORATION

617-629 Grant Building, Atlanta, Georgia

A Review of

Insecticide-Fertilizer Mixtures

By Walter M. Kulash

North Carolina Agricultural Experiment Station, Raleigh

Part II. PROBLEMS

THE increased interest in the use of insecticide-fertilizer mixtures would indicate that the major problems in the production and use of such mixtures have been overcome. New, quick-acting insecticides can be mixed with fertilizers. Thus insecticide and fertilizer can be applied in one operation with one piece of equipment and a resulting saving in labor, time and money. This appears to be an ideal method of application for the control of some soil insects. However, there are advantages and disadvantages associated with insecticide-fertilizer mixtures. These are best understood if we consider the problems attendant upon (1) the manufacture and distribution of such mixtures, (2) their effect upon soils and crops, (3) their effect upon insects and (4) the acceptance of such mixtures by the grower. For a further discussion of some of these problems, reference should be made to the following papers: Bentz 1952, Mehring 1951, 1953, Thames, 1951, Tiedjens 1952 and Watts 1951.

Manufacture and Distribution

Some of the features in the mixing of insecticides with fertilizers are regarded as a distinct disadvantage by some formulators. A recent panel discussion[1] on this subject has brought these matters to the fore. Special care must be taken all through the mixing cycle with the type of carrier used, with careful checks on the effect of temperature on each batch that is mixed. Furthermore, it is difficult to mix a small amount of insecticide thoroughly with a large amount of fertilizer. These are some of the problems encountered in the actual mixing of an insecticide with a fertilizer. In some instances, these problems are further aggravated by the inability of the mixer to guarantee the analysis of his final product. All of these items may be regarded as distinct disadvantages coupled with the added cost of production due to the extra care and the special equipment required. Mehring (1953) touches on some of these problems.

There is a need for more detailed information on the compatibility of insecticides with different fertilizers and reactions during storage. DDT has been found to have no catalytic activity with numerous fertilizer compounds (Fleck and Haller 1945). Additonal studies of this type are needed for the numerous other insecticides used in combination with fertilizer.

Other problems arise in the marketing of insecticide-fertilizer mixtures. The correct grade of fertilizer must be used and the proper amount of insecticide per ton of fertilizer must be calculated. The grade of fertilizer to be used and the amount of fertilizer used per acre will depend upon the crop to be grown, but the type and amount of insecticide will depend upon the insect to be controlled. It is conceivable that a given insecticide may be used effectively against the same pest attacking more than one crop which require different amounts of fertilizer. Such a situation would require a custom mix for each crop in order to insure that the correct amounts of fertilizer and insecticide were applied to each crop. This problem has caused many formulators to regard insecticide-fertilizer mixtures for some areas as a special custom mix proposition. As a result, the formulator mixes only what he is asked for. He has no storage problem, no concern about carry-over to the next season or with possible deterioration of the mixture during the storage period.

Non-custom mixtures are a specialty item which the formulator must evaluate carefully before he decides to market them. First, the formulator must determine what the potential demand will be for each mixture for the current season. He must not depend on holding over any stock. The uncertainty of the demand for special mixtures should caution the formulator not to produce more than he can dispose of in the current season. Some formulators are able to investigate adequately what pests insecticide-fertilizer mixtures may be used for in their locality and strive to fulfill this use.

With all of the formulating and marketing details worked out, there is still one important item to attend to before the mixture can be offered for sale, and that is registration.

[1]Reported in Farm Chemicals 116 (10): 23, discussions under chairmanship of Dr. L. Gordon Utter, (Diamond Alkali co., Newark) held in conjunction with the 20th annual meeting of the National Agricultural Chemicals Association, Sept. 9–11, 1953, at Spring Lake, N. J.

Table 2. Patents of Insecticide-Fertilizer Mixtures

Country	Patent Number	Date of Patent	Issued To:	Reference[1]
Canada	338,803	1934	Mulligan, J. D.	28:2116[9]
	346,134	1934	Grose, E. M.	29:2290[4]
France	346,024	1904	Jenkner, R. & J. Pleyl	1:376[9]
	364,288	1906	Filliozat	1:2428[6]
	693,528	1930	Lotrionte, G.	25:1625[6]
	747,795	1933	Petroff, P. C.	27:5140[9]
	820,574	1937	Garcia, L.	32:3079[3]
Germany	506,485	1927	Schmidt, P.	25:3738
	531,560	1928	Schmidt, A., Steindorff, A. and W. Stauderman	26:248[1]
Great Britain	8,779	1908	Dokkenwadel, F. G.	3:1570[1]
	19,295	1913	Keep, G. H.	9:503[8]
	120,288	1917	Truffaut, G.	13:631[2]
	438,006	1920	Lange, M.	1927:566*
	230,148	1923	Ilingworth, C. and H. H. Duckworth	19:3345[7]
	235,802	1925	Bryon, A. G.	20:964[3]
	356,195	1929	Dedolph, E.	26:3066[2]
	358,957	1929	Lotrionte, G.	26:3066[2]
	461,464	1936	Margules, V. and J. Trummer	1937:482*
	571,484	1943	Jamoson, H. R. and Imperial Chemicals, Ltd.	B III:1945:246* 41:1383 a
United States	824,791	1906	Jenkner, R., M. Jenkner, & J. Pleyl	1:114[3]
	839,112	1907	Chisolm, W. B.	1:654[8]
	888,148	1908	Dokkenwadel, F. G.	2:2837[8]
	943,668	1910	Ellis, C.	4:633[8]
	968,003	1911	White, R. G.	4:2973[8]
	1,347,798	1920	Truffaut, G.	14:2836[3]
	1,472,675	1924	Reed, M. C.	18:437[9]
	1,696,709	1928	Dokkenwadel, F. G.	1929:733*
	1,922,909	1932	Dickey, C. B.	27:5140[5]
	1,976,906	1934	Thordason, W.	1935:869*
	2,095,366	1937	Marsico, S. E.	1940:478* 31:8811[1]
	2,333,061	1943	Van Over, D. L.	38:P3774[9]

***All patent references with an asterick taken from the British Chemical Abstracts (London). All other patent references taken from Chemical Abstracts (Easton, Pa., published by the American Chemical Society).**

Federal registration of mixtures of certain fertilizers and aldrin, chlordane, DDT and heptachlor is permissible. The following fertilizer ingredients may be used with the above named insecticides: anhydrous ammonia, water solution of ammonia, ammonium sulfate, ammoniated superphosphate, superphosphate, treble superphosphate, muriate of potash and sulfate of potash magnesium (White 1954). State laws treat insecticide-fertilizer mixtures in different ways. In some states there are no rules and regulations pertaining to the labeling, registration and sale of such mixtures[1]. Other states require that the mixture be registered as an insecticide and as a fertilizer. In North Carolina, registration of certain mixtures is permitted. Aldrin, DDT, dieldrin, heptachlor and toxaphene may be included in fertilizers and such mixtures shall bear a special red tag naming the type and amount of insecticide contained (Ballentine 1953).

New rules and regulations are being constantly announced. The formulator is advised to approach the problem of labeling from the insecticidal and fertilizer requirements of the area for which the mixture is intended.

No doubt there has been some hope among many formulators that insecticide-fertilizer mixtures would be a boon to sales. However, after their initial experiences with such mixtures, some formulators have recommended highly that the farmer find some other method of applying insecticides than in combination with fertilizer.

A conservative view on the use of insecticide-fertilizer mixtures is taken by the Southern Association of Feed and Fertilizer Control Officials. A resolution[2] passed by this group on June 21, 1951, recommended that fertilizer control officials of this group not register or permit the sale of fertilizers containing pesticides for field or horticultural use, unless such mixtures have been formally approved by officials of the Agricultural Experiment Station or other officials vested with such responsibility by law in their state. This resolution has also been adopted[2] by the Association of American Control Officials, The Association of Economic Poisons Control Officials and the Association of Presidents of the Land Grant Colleges. The resolution further stated that mixtures of pesticides and fertilizers which are offered for sale should be properly labeled and meet all requirements of both the fertilizer and pesticide laws of the various states.

Effects on Soils and Crops

The possibility of better soil insect control with new insecticides mixed with fertilizer has increased the attention paid to the action of insecticides in such mixtures on the microorganisms in the soil. The effect of calcium arsenate on soils and plants has already been mentioned (Cooper *et al.* 1931, Dorman and Coleman 1939). The effects of the newer organic materials have been studied by numerous workers, especially in reference to the microorganisms in the soil.

The effects of DDT on certain microbiological processes in the soil have been reported by Wilson and Choudhri (1946). These workers concluded that ammonification, the accumulation of nitrate and normal concentration of salts in the soil did not seem to be affected or seriously modified by DDT used in amounts excessive of those used in ordinary agricultural practice.

DDT, 2 per cent dust, at dosages up to 100 pounds per acre, had no inhibitory effect on height of legumes grown in sand, according

[1]In a report of a survey made in April-May 1954, R. C. Berry, state director, Division of Chemistry, Richmond, Va., lists 22 out of 31 states as reporting that they had no regulation covering the sale and distribution of pesticide-fertilizer mixtures.

[2]As reported by Rodney C. Berry, state chemist, Virginia, in Agric. Chem. 8 (10): 123.

to Appleman and Sears (1946). Nodulation was not reduced until a dosage of 1,000 pounds per acre was reached. Smith and Wenzel (1948) found no injury to soil microorganisms at dosages of 100 to 400 pounds per acre. Jones (1950) found DDT at concentrations of over 0.1 per cent in the soil to be toxic to ammonifiers, as were chlordane and BHC at the same concentrations. Chlordane at .01 per cent had no effect. Jones concluded that all three of these materials could be used in the soil at concentrations normally applied for pest control without any danger to nitrifiers or ammonifiers.

BHC is considered more injurious to soil microorganisms than is DDT. At 100 and 500 pounds per acre of 10–12 per cent gamma isomer of BHC, Smith and Wenzel (1948) reported definite fungicidal action; also, a reduction of nitrifiers. An application of 30 p.p.m. of toxic material in BHC was injurious to legumes (Wilson and Choudhri 1948). One pound per acre of gamma isomer of BHC inhibited damping-off fungus (*Rhizoctonia*) in sand but chlordane at 10 pounds per acre did not (Simkover and Shenefelt 1951).

Toxaphene is easily broken down in the soil. Smith and Wenzel (1948) state that is is beneficial to soil bacteria and fungi but that it may have an apparent inhibitory effect on nitrifiers.

Aldrin, dieldrin, heptachlor, chlordane and parathion have been used in tests for wireworm control in corn grown in peat muck soils (Kulash and Monroe 1954b). At rates of 1 to 4 pounds of actual toxicant per acre, no effect on germination or growth of corn was noted.

For a more complete discussion on the effects of some of these materials on plants, reference should be made to Foster (1951).

Besides the effect of insecticide-fertilizer mixtures on the soil microorganisms, the residual effect of such mixtures in the soil must be considered. A long, lasting residual effect may be desirable from the standpoint of controlling insects but it may be a very undesirable quality in respect to the possibilities of off-flavor or possible effect on the physiology of the plant.

The problem of continued use of soil insecticides must not be overlooked. The use of calcium arsenate for cotton boll weevil control caused much concern in the days when this insecticide was widely used. The use of new materials has not resolved the problem but has merely shifted the emphasis to other materials.

At most of the dosages reported for the different insecticides, as listed in table 1, there has been little or no lasting adverse effects on soil microorganisms, seed germination or plant growth. Repeated annual applications may eventually result in an excess accumulation of insecticide in the soil which may have some effect on soil microorganisms or on plant growth. Such accumulations may more likely occur where the entire soil surface is treated than in insecticide-fertilizer mixtures applied in a narrow band or bands in row crops. The possibility of adverse accumulations of insecticide is taken into consideration in the recommendations for white-fringed beetle larva control (Anon. 1954). In the case of DDT, it is recommended not to build up a residue in excess of 25 pounds per acre through repeated applications. The recommended amount to use in row treatment is 1 to 3 pounds of DDT per acre whereas 10 pounds of DDT per acre may be used when applied as a broadcast treatment worked into the soil.

Effect on Insects

A brief review of the literature shows that mixtures of fertilizers with new insecticides have been used experimentally against 30 or more insect pests (table 1). The interest in such mixtures has brought about many suggestions for their use. In some instances, insecticide-fertilizer mixtures are not always practical. For example, fertilizer-insecticide mixtures have been suggested for controlling the maize billbug in certain sections of North Carolina. Directions for control specified that the mixture be applied at the time of planting corn and that application be made directly into the open drill row, as a starter mixture. Unfortunately, such a method of application is not efficient for it does not reach the majority of the billbugs. A few facts about the life history of this insect indicate why this method will not work. Most of the adult billbugs do not overwinter in the field where they have been attacking corn the season before. Usually, they move out to surrounding ditch banks or other places where there is adequate cover to overwinter. In the spring, as corn begins to break through the ground (or somewhat later) billbugs move into the fields from their hibernating quarters and begin to feed on corn. Except for those billbugs in the field at the time that the mixture was applied, there is no possibility of the billbug's coming in contact with the material applied in the soil by walking over the surface of the soil to reach the plant. Kill by contact under such conditions can be ruled out.

Another instance in which insecticide-fertilizer mixtures have been suggested is in the control of wireworms. In the case of one of the common wireworms (*Melanotus communis* Gyll.) in eastern North Carolina, starter mixtures of insecticide-fertilizer have not been successful in cases of heavy infestation, but they may have been of some value in areas of light infestation. The reason for this is that the mixture at first affords some protection against wireworms. As the plant grows older and as more soil is moved to the plant by cultivation the wireworms are able to get around the area or through the area of treatment and penetrate the stem of the plant. Wireworms are able to avoid the treated area and yet hit the plant by either going between the bands of fertilizer or by moving around and over the treated area, especially where cultivation has moved sufficient soil to cover the area.

Some workers report good results with insecticide-fertilizer. In South Carolina, mixtures with chlordane and other organics have been found successful and recommended in controlling the sand wireworm (Watts 1949, Woodle and Nettles 1950, and Watts and Nettles 1951). In Iowa, there has been a great deal of interest in starter fertilizers with aldrin, heptachlor and other insecticides for controlling the corn rootworm. The insecticide-fertilizer method of application is one

of three methods available for controlling this pest (Lilly 1954). The other two methods consist of (1) spraying the stalks on plowed ground and (2) spraying the trench behind the planter shoe.

The use of insecticide-fertilizer mixtures requires some knowledge of insect life history on the part of the user in order to carry out an effective job of control. In the case of a foliage pest, it is easy to tell when the plant is being damaged and, usually, finding the pest responsible is not a difficult task. In the case of subterranean pests, it is sometimes difficult to tell what pest is responsible for the damage. This is made more difficult when several pests may be involved. Then the question arises, will the insecticide-fertilizer treatment be equally effective against all of these pests? Furthermore, what is the best time to make an application? And, if more than one application is necessary is the insecticide-fertilizer method the best?

Acceptance by Growers

The description of the different problems associated with insecticide-fertilizer mixtures indicates the complexity of the situation that the grower must resolve if he is to use such mixtures effectively. In most instances the grower is not in a position to have all the facts he may need in order to make a wise decision. He is hampered by the newness of some of the insecticides whose use in the soil has not been completely evaluated. Furthermore, the soil pests involved may be new to the grower. It may be difficult for him to evaluate or predict damage by these pests. Hence, the grower may not feel justified in using an insecticide-fertilizer. In addition, if too high a premium is asked for such mixtures, the grower may unjustifiably refrain from treating the crop in this manner because of the high cost.

Because of the incomplete and fragmentory data available on most insecticide-fertilizer mixtures and on the pests such mixtures are supposed to control, and because of the limited information on the effects produced on soil and soil inhabiting microorganisms, the farmer will probably want to use such mixtures only in special cases. Until such time as sufficient data become available, it is suggested that insecticide-fertilizer mixtures be carefully advocated and intelligently used.

Summary

Insecticide-fertilizer mixtures have been used for over 50 years. Patents relating to such mixtures exist as far back as 1904. Some 31 patents have been noted, originating in US, France, Great Britain, Germany and Canada since 1904. Use of insecticide-fertilizer mixtures in North Carolina was first approximated by Fulton(1946) for the control of the southern corn rootworm (*Diabrotica undecimpunctata howardi* Barber). Since this time, a short review of the literature has shown that insecticide-fertilizer mixtures have been used experimentally and otherwise against 30 or more insect pests.

The advantages and disadvantages of insecticide-fertilizer mixtures are considered from the standpoint of problems arising in (1) their manufacture and distribution, (2) their effects on soils and crops, (3) their effect on insects and (4) their acceptance by growers. ◆

Literature Cited

Allen, N. 1950—Proc. 10th Ann. Tobacco Insect conf. (Gainesville, Fla.) June 6–8, 1950: 9 pp. (Mimeographed, July 27, 1950).

Anon. 1954—N.C. State Coll., Div. Biol. Sci., Information Note No. 91: 3pp.

Appleman, M. D., and O. N. Sears. 1946—Jour. Amer. Soc. Agron. 38:545–50.

Armand, J. E. 1948—Ann. Rpt. Ent. Soc. Ontario 78:15–24. (1947).

Ballentine, L. Y. 1953—Rules, regulations, definitions and standards of the N.C. Dept. of Agr. Chap. VIII:10–11 (revised to Sept. 15, 1953).

Bentz, F. L. Jr. 1952—Agric. Chem. 7(5):63–5.

Blattny, C. 1936—Ernähr. Pflanze 32:333 (Chem. Abs. 31:201[7]).

Colby, G. E. 1902–3—Calif. Sta. Rpt. 1902–3: p. 93.

Compton, C. C. 1949—Agric. Chem. 4(5):29,43

Comstock, J. H., and M. V. Slingerland. 1891—Cornell Univ. Agr. Exp. Sta. Bul. 33:193–272.

Cooper, H. P., W. R. Paden, E. E. Hall, W. B. Albert, W. B. Rogers and J. A. Riley. 1931—S. C. Agr. Exp. Sta. Ann. Rpt. 44:28–36.

Cox, H. C., and J. H. Lilly. 1953—Jour. Econ. Ent. 46:217–24.

Dahms, R. G., and F. A. Fenton. Jour. Econ. Ent. 33:688–92.

Dominick, C. B. 1950—Jour. Econ. Ent. 43:295–8.

Dorman, C., and R. Coleman. 1939—Jour. Amer. Soc. Agron. 39:966–71.

Eden, W. G. 1953—Jour. Econ. Ent. 46:509–10.

Fleck, E. E., and H. L. Haller. 1945—Ind. and Eng. Chem. 37:403–5.

Fleming, W. E. 1942—USDA Tech. Bull. 788:32 pp.

———. 1950—Jour. Econ. Ent. 43:87–9.

Floyd, E. H. 1949—Jour. Econ. Ent. 42:900–3.

———, **and C. E. Smith.** 1949—Jour. Econ. Ent. 42:908–10.

Foster, A. C. 1951—USDA Circ. No. 862: 41 pp.

Fulton, B. B. 1946—Jour. Econ. Ent. 39:781–3.

Gough, H. C. 1945—Imperial Institute of Ent. (London): 161 pp.

Harlan, W. P. 1946—Citrus Leaves 26(1):6–7. (Che. Abs. 40:2256[8]).

Hawkins, J. H. 1928—Me. Agr. Exp. St. Bull. 343: 20 pp.

Howe, W. L. 1950—Jour. Econ. Ent. 43:549–50.

———, **and W. V. Campbell.** 1953—Jour. Econ. Ent. 46:766–71.

Jones, W. L. 1950—Utah Agr. Exp. Sta., Farm and Home Science 11 (3):58–9.

Kelsheimer, E. C. 1947—Fla. Agr. Exp. Sta. Bull. 434:19 pp.

———. 1948—Down to Earth 4(2):2–3.

———. 1950—Market Growers Jour. 79(1):32,33.

Kulash, W. M. 1947—Ms. 10 pp.

———. 1949—Ms. 11 pp.

———. 1954—The Progressive Farmer 69(4):157,163.

———, **and R. J. Monroe.** 1954a—Jour. Econ. Ent. 47: (in press).

———, **and** ———. 1954b—Jour. Econ. Ent. (in press).

Langebuch, R. 1933—Z. angew. Entomol. 20:296–306. (Chem. Abs. 27: 5828[8]).

Lilly, J. H. 1954—Better Farming Methods 26(1):10,14.

Marcovitch, S., and W. W. Stanley. 1950—Com. Fert. 80(2):30,32,33.

McDougall, W. A. 1934—Queensland Agric. Jour. 42:690–726. (Chem. Abs. 29:3763[3]).

McGarr, R. L. 1943—Jour. Econ. Ent. 36:640.

Medler, J. T. and A. R. Albert. 1953—Jour. Econ. Ent. 46:793–7.

Mehring, A. L. 1951—Com. Fert. 82(1): 32–40.

———. 1953—Chap. XIV, p. 413–38, in "Fertilizer Technology and Resources, III," edited by K. D. Jacobs.

Merrill, L. G. Jr. 1952—Jour. Econ. Ent. 45:548–9.

Neale, A. T. 1891—Del. Sta. Rpt. for 1891:22–31.

Neuwirth, F. 1932—Ernährhr. Pflanze 28:14–8. (Chem. Abs. 26:5374[8]).

Polivka, J. B. 1950a—Jour. Econ. Ent. 43:391–2.

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———. 1950b—Jour. Econ. Ent. 43:936.
Poos, F. W. 1942—USDA Leaflet 229:8 pp.
———, **T. N. Dobbins, E. T. Batten and G. M. Boush.** 1951—USDA, BEPQ, E–820: 16 pp.
Reid, W. J. Jr. 1936—Jour. Econ. Ent. 29:973–80.
Ritcher, P. O., W. M. Kulash, E. T. York, Jr. and W. E. Cooper. Jour. Econ. Ent. 45:965–9.
Robinson, J. M. 1942—Ala. Agr. Exp. Sta. 53rd Ann. Rpt., 1942: 28–9.
———, **and F. S. Arant.** 1932—Jour. Econ. Ent. 25:759–66.
———, **and E. L. Mayton.** 1941—Ala. Agr. Exp. Sta. 52nd Ann. Rpt. 1941: 28,29.
Schread, J. C. 1948—Jour. Econ. Ent. 41:318–24.
———. 1949—Jour. Econ. Ent. 42:499–502.
———. 1953—Jour. Econ. Ent. 46:357–9.
Simkover, H. G., and R. D. Shenefelt. 1951—Jour. Econ. Ent. 44:426–7.
Smith, J. B. 1891—N. J. Sta. Bull. 85: 12 pp.
———. 1893a—Ont. Ent. Soc. Rpt. 1893:68–70.
———. 1893b—Insect Life 6(2):93–7.
Smith, M. R. and M. E. Wenzel. 1948—Proc. Soil Sci. Soc. Amer. 1947, 12:227–33.
Stone, P. C., and G. E. Smith. 1951—Jour. Econ. Ent. 44:810–1.
Thames, W. H. Jr. 1951—Fla. Agr. Exp. Sta., mimeo. paper, 12 pp. presented at the annual conv. of the Assn. of So. Feed and Fert. Cont. Off., June 1951, St. Petersburg, Fla.
———. 1954—Corresp. to the author, May 3, 1954.
Theobald, F. V. 1927—SE Agric. Coll., Wye., Bull. 5:3–6.
Thomas, W. A. 1911—Clemson Agric. Coll. Agr. Exp. Sta. Bull. 155: 10 pp.
Tiedjens, V. A. 1952—Agric. Chem. 7(3):45–7,118,119,120.
Watts, J. G. 1949—The Southern Planter (Apr.) p. 10.
———. 1951—Agric. Chem. 6(4):36–8, 115,116,117.
———, **and W. C. Nettles.** 1951—Jour. Econ. Ent. 44:619–20.
White, R. O. 1954—Corresp. to the author, May 13, 1954.
Wilson, G. 1951—Cane Growers Quart. Bull. 15:18–21. (Soils and Fert. 14:2265).
Wilson, J. H., and R. S. Choudhri. 1946—Jour. Econ. Ent. 39:537–8.
———, and ———. 1948—Jour. Agric. Res. 77:25–32.
Wilson, M. C. 1951—Jour. Econ. Ent. 44:792–6.
Wolf, D. C. 1952—Country Gentleman 122(12):26.
Wolfenbarger, D. O. and E. G. Kelsheimer. 1950—Proc. Fla. St. Hort. Soc. 1950: 93.
Woodle, H. A., and W. C. Nettles. 1950—Clemson Agr. Coll. Ext. Service Circ. 352:15 pp.
Young, H. C. and J. B. Gill. 1948—USDA, BEPQ, E-750: 8 pp. ♦

Potash Imports Hit

DOMESTIC potash producers hit at foreign imports in a series of Tariff Commission hearings during January and followed up with a call for action under the Anti-dumping act to halt possible injury from French and East German imports.

The hearings originated from December findings of the Treasury department that East German muriate of potash is being sold at less than "fair" market value.

The demand for action was made by five American producers: Duval Sulphur & Potash co., International Minerals & Chemical corp., Potash Co. of America, Southwest Potash corp. and United States Potash co. Counsel for the companies repeated warnings delivered in the earlier hearings, pointing out that the only difference was the source of the potash.

French Imports

Henry E. Lefevre, president of French Potash & Import co., said that French imports have not been sufficient to disrupt marketing of American producers and cited the advantages of quality, service and reliability held by domestic companies. American buyers continue to buy the imported product, said Lefevre, mainly because of established businesss relationships, investment by some in facilities for handling water-borne shipments and the desire to keep open a secondary source of supply.

Other companies that appeared in behalf of the importers were Summers Fertilizer co. and Fertilizer Industries, Inc. The American Farm Bureau Federation is also opposed to added duties on potash imports.

East German Muriate

At the January hearings, Paul Speer, vice president and general counsel of United States Potash co., told the commission that the threatened loss to US industry by East German muriate sales is $2.5 million annually with an added loss of possibly $2 million in railroad revenues moving the potash to eastern markets.

Speer added that it is the eastern markets in which the imported product can be sold in competition with the domestic material, an area extending 300 miles in from the Atlantic coast. He pointed out that the threatened loss is a considerable percentage of domestic industry sales which totaled $56 million in 1953.

A. Norman Into, vice president, International Minerals & Chemical corp., also attacked the Iron Curtain material, warning that its price could drop even further if domestic producers attempted to meet the "Russian price."

Into reported that International had agreed to cut its price by two dollars and the Atchison, Topeka & Santa Fe railway proposed a $1.50 per ton reduction in freight rates last April. However, the amount of potash imports anticipated did not develop, largely because of a Congressional investigation and the action taken by potash producers in initiating the anti-dumping proceedings. Without these actions, he said, large tonnages of East German material would have moved into the U.S. in 1954–55 at a 50 cents per unit price.

He quoted Montreal prices of 45 cents per unit, commenting that "there is no reason to think they could not go as low or lower in the United States."

Counsel for Woodward & Dickerson, Inc., Richardson Dilworth, argued that imports are used to fill an unsatisfied demand and he tried to bring out, in questioning Speer, that domestic producers' sales since the end of World War II increased every year but 1953. ◆

Morse Featured on NAC Program

BETTER Farming with Agricultural Chemicals is the theme for the spring meeting of National Agricultural Chemicals Association scheduled for March 7–9 at the Chase hotel, St. Louis, Mo. Featured speaker will be Under Secretary of Agriculture True D. Morse who will address a luncheon-banquet gathering on "Agriculture that is—Stable, Prosperous and Free."

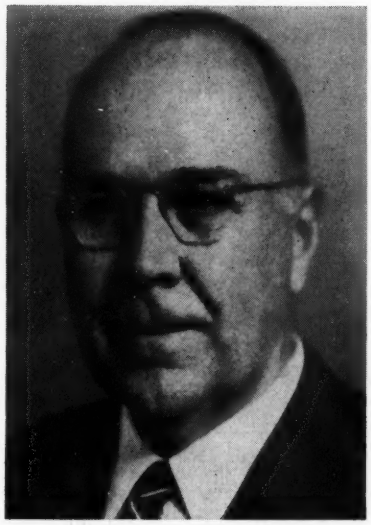
Panel Discussions

Three panel discussions concerning herbicides, soil insecticides and the Miller Bill will also highlight the program.

NAC herbicide specialist, Jack Dressen, will moderate the first of these groups, an expert panel that will discuss the future of herbicides. Other members include Dr. Lloyd V. Sherwood, Monsanto Chemical co.; Hillard L. Smith, Dow Chemical co.; Dr. A. E. Carlson, E. I. DuPont de Nemours; Dr. M. W. Parker, USDA and Dr. R. D. Sweet, Cornell University.

In the second of these panels, leading scientists will take a look at the future of soil insecticides. Participants include Dr. George W. Decker, University of Illinois, moderator; Dr. John H. Lilly, Iowa State College; Dr. Charles C. Compton, Shell Chemical corp. and Dr. O. N. Allen, University of Wisconsin.

NAC staff members and top government officials will take part in a panel discussing what must be done to comply with the Miller Bill. The subject of tolerances will also be reviewed during the three hour session. Lea Hitchner will serve as moderator with panelists Winton B. Rankin, FDA; Dr. W. G. Reed, USDA; John D. Conner, NAC counsel and Joseph A. Noone, NAC technical advisor.



True D. Morse

Speakers

NAC's president W. W. Allen, Dow Chemical co., will take a fresh look at the industry's future in his address on "Farm Chemicals —A Realistic Outlook." Other featured speakers and their topics include Fred Heinkel, president, Missouri Farmers Assn., "Farm Chemicals—The Farmer's Viewpoint;" Donald A. Wilbur, Iowa State College entomologist, "Grain Storage—The Farmer's and Country Elevator's Problem" and John L. Gillis, vice president, Monsanto Chemical co., "Disorder out of Chaos."

Lea Hitchner, NAC executive secretary, is scheduled to make an up-to-the-minute report on state legislation with an analysis of the implications of new proposals on the books.

The afternoons of both the first and second days will be devoted to individually scheduled committee meetings. A reception for members and guests will be held on the evening of March 7.

Closing date for the convention is 3:00 p.m., March 9. ◆

Tolerance Rules Issued

By John Harms

GOVERNMENT residue tolerances of pesticides on fresh fruits and vegetables go into effect July 22. After that date, the Food and Drug Administration will be prepared to test and seize interstate shipments of commodities which carry more than the legally-permitted pesticide residues or those carrying residues of poisons for which none are permitted.

Final regulations under the Miller amendments to the Federal Food, Drug and Cosmetics Act went into effect March 7. The FDA hopes to have all applications processed in the intervening period. Officials point out that applications worked up under the tentative regulations

issued last October were acceptable since the finally approved regulations are changed but little as far as technical procedure is concerned.

Food & Drug officials are asking manufacturers to get tolerance applications in as soon as possible —"to clear the decks so you'll be in business for sure come July 22, and so farm commodity shippers won't be gotten into trouble."

Officials are of the opinion that most products now on the market should be in compliance with the new regulations. Some manufacturers will have to amend their pesticide registrations with the Agriculture department to bring them up with label requirements under the regulations.

One of the big problems that still is not solved, according to FDA people, is that of getting farmers to read the manufacturer's label and use the pesticide accordint to instructions. The Cooperative Federal-State Extension Service is expected to follow up with a big publicity campaign to alert farmers to the new regulations.

Changes Made

Here are some of the important changes in the regulations made by the Food & Drug Administration since they were tentatively proposed:

(1) The Pesticide Branch of FDA will notify a petitioner within 15 days after receipt of an application of the acceptance or non-acceptance of a petition. It must also give reasons.

(2) A petitioner can supplement information in a petition after he's been notified that it is deficient.

(3) The Pesticide Branch may request a sample of the pesticide chemical at any time while a petition is under consideration. If the sample is not submitted within 180 days after mailing date of the FDA request, the petition will be considered withdrawn . . . without prejudice.

(4) Unless the petition is referred to an advisory committee, the FDA is compelled to publish in the Federal Register within 90 days after Agriculture department receipt of the certification of usefulness a regulation setting up a tolerance for residues, or exemption from a tolerance. ◆

New Fee Schedule

Deposit	Coverage
$500 plus $50 for each raw agricultural commodity over nine on which a tolerance is requested.	**To accompany each petition for establishment of a tolerance.**
$750 plus $50 for each raw agricultural commodity over 14 on which a tolerance is requested.	**With petitions requesting two or more numerical tolerance levels.**
$50 plus $50 for each raw agricultural commodity to which extension is requested.	**When extension of an established tolerance to added commodities is requested.**
$500	**Petition for an exemption or a temporary exemption from a tolerance, a temporary tolerance or repeal of a tolerance or exemption.**
$50 clerical handling and initial review fee.	**Remainder of deposit returnable if petition is not accepted because it is technically incomplete. If a supplement is submitted, a non-returnable fee of $50 is required.**
$150 or deposit equal to one originally submitted, whichever is smaller.	**For a petition withdrawn after filing and resubmitted within 6 months. After 6 months, same deposit as required with initial petition. Also when added information is submitted after a petition has been filed.**
$250 filing fee.	**With objections under section 408 (d) (5).**

ADVISORY COMMITTEE

When a petition is referred to a committee, the costs shall be borne by the person who requests the referral of data to the advisory committee.

$75 per member per day, plus cost of duplicating documents referred to committee, plus travel and subsistence expenses of members while serving away from place of residence.	**Limit on committee expenses. (Includes expenses of secretariant) Law provides for pay limit of $50 per day plus expenses. Subsistence expenses not to exceed $25 per day.**
$2,500 advance deposit.	**To cover costs. Added $2,500 deposits upon request of commissioner when necessary to prevent arrears in payment of such costs. Any excess will be refunded.**

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NE Weed Control Conference

J. D. Van Geluwe, GLF Soil Building Service, 1956 president, and A. O. Kuhn, University of Maryland retiring president of NE Weed Control Conference.

PRESENT status of weed control and some of the future problems to be faced were discussed by several prominent scientists in a panel discussion held during the Northeastern Weed Control conference in New York city, Jan. 5–7.

G. H. Ahlgren, head of the Rutgers Farm Crops department, commented on the many problems to be faced before chemicals can be fully utilized in field crop weed control. We need to know more about the life habits of weeds themselves, Dr. Ahlgren explained, so that they can be struck where they are weakest. Weed indentification also needs greater stress, he added, since chemicals are tending to become specific for specific pests.

Ahlgren also emphasized the need for more trained men in the weed control field, pointing out that although weed problems affect more people than do those of insects, there are only 200 weed control specialists in the country compared to some 3,000 entomologists.

Brush Killer Potential

A big potential for brush killers in the Northeast was seen by R. H. Beatty, American Chemical Paint co. Widest acceptance of chemicals for woody plant control has been by telephone, power line and pipeline companies for maintaining rights-of-way, said Beatty, past president of the conference, and use for control of vegetation along roads is increasing rapidly.

Another big field is the control of brush in pastures, and he estimated that New York alone has three million acres of pasture land with some 60 per cent infested with thorn apple, brambles and other woody shrubs.

Control of hardwood species in evergreen plants is also a promising usage, according to Beatty. He pointed out that some hardwoods are difficult to control with present materials but that some new chemicals show promise. He cited use of amino triazole for control of white ash and recent indications that oak can be controlled effectively with 2,4,5-trichlorophenoxypropionic acid.

The fourth member of the panel, R. C. Sweeny of the New York State Conservation department, cited data showing the importance of weed control to human comfort. There are about 1.7 million people in the Northeast, he estimated, 4–5 per cent of the total population, who suffer from allergies due to pollen. Much of this pollen comes from plants that can be chemically controlled.

Chloro-Acetamide

Monsanto Chemical co. announced a new weed killer at the conference, identifying it as chloroacetamide. When applied to the soil at planting time, it has killed grassy weeds without harm to crop plants. Corn, itself a grass, is among the crops in which weed grasses have been controlled.

Tests have been conducted at several locations in the United States and the chemical has proven less affected by variations in soil and moisture conditions than many other materials.

In his opening address, USDA's Dr. Marion W. Parker traced the development of weed control research in this country, stressing organization and objectives of the Weed Investigation section, Field Crops Research Branch, ARS, which he heads.

Commenting on the magnitude of current weed control operations, Dr. Parker stated that in 1952 some 33.5 million acres were sprayed for weed and brush control. In comparison he pointed out that acreage sprayed for insect and disease control was sone 13.5 million acres lower.

The figure for 1952 weed operations was further broken down to show that 18 million acres of small grains were sprayed, 9.5 million of corn, 2.5 million of pasture and rangeland and over 3.5 million of other crops.

Some 26 million dollars were spent for chemicals by farmers who themselves sprayed 70 per cent of the total acreage. On the remaining 30 per cent of the sprayed acreage, custom operators furnished and applied herbicides at a cost of about 22 million dollars. Ten million dollars were spent for air application on an estimated 15 per cent of the total acreage.

Granular Formulations

In closing, Parker emphasized that research and extension will be the limiting factors in the increasing utilization of herbicides.

L. L. Danielson reported on comparisons of granular

and spray applications of herbicides on vegetable crops, stating that granular materials such as clay, vermiculite or tobacco pulp containing absorbed chemicals have proven to be an effective means of applying weed killers.

Advantages cited include the decreased damage in some cases in growing crops as compared to sprayed materials and the greater ease of application.

The Virginia scientist said that tests have shown Crag I, Chloro-IPC, Dalapon and CMU impregnated in pellets have been as effective as the same materials applied as a spray.

Dr. Charles J. Willard, president of the American Society of Agronomy, said that the use of chemicals has caused a revolution in weed control in less than 10 years, but he warned that many problems remain to be solved. He referred especially to work required on the specific response of each important crop and weed species to each promising chemical.

Much more information is needed about weed seed germination and growth habits of weeds, he added, and the influence of weather and soil conditions upon the action of herbicides has become increasingly evident.

Also emphasized by the Ohio agronomist was the need for continued study of cultural control methods, especially in combination with chemicals.

Some 100 papers were presented at the conference by research scientists of the 12 northeastern states. An increased interest in weed control in horticultural crops was evident, as more than one-third of the papers related to this subject. Over 500 persons attended the meetings.

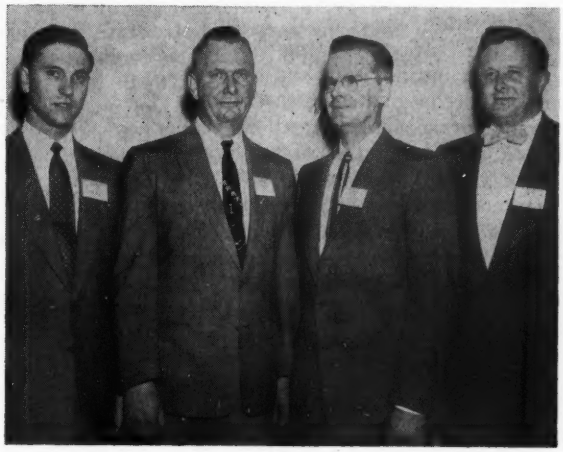
Officers elected to head the 1956 conference include J. D. Van Geluwe, GLF Soil Building Service, president; L. L. Danielson, Virginia Truck Experiment Station, vice president; R. J. Aldrich, Rutgers University; and Donald Schallock, Rutgers University, treasurer. Retiring president was A. O. Hun of the University of Maryland Agronomy department.

Committee chairmen for the 1955 conference included W. W. Smith, Univ. of New Hampshire, Program; L. L. Danielson, Virginia Truck Exp. Sta., Program; R. J. Aldrich, Rutgers University, Publications; C. L. Hovey, Eastern States Farmers' Exchange, Sustaining Membership; R. A. Peters, University of Connecticut, Public Relations and R. H. Beatty, American Chemical Paint co., Awards.

A certificate of merit and $100 was awarded to Marvin M. Schreiber, Cornell University, for presenting the best paper delivered at the meetings. They were presented by R. H. Beatty for Schreiber's "A Comparison of MCP and 2,4-D for Weed Control in Forage Legumes."

It was announced at the conference that the charter meeting of the Weed Society of America will be held in New York on Jan. 4–6, 1956. R. H. Beatty is to be president of the new group. On the first two days of the meeting, national proceedings will take place and the final day will be "Northeastern Weed Control Conference Day." The northeast group will serve as hosts. No oral presentations of papers will be made at the regional meetings next year; papers will be published in the proceedings.

It was requested that companies with new chemicals showing herbicidal promise send information to the conference secretary for publication in a newsletter to be issued twice during the year. K. P. Buchholtz, University of Wisconsin, was named the new editor of WEEDS. ◆



1956 officers, NE Weed Control Conference: R. J. Aldrich, Rutgers University; J. D. Van Geluwe, pres., GLF Soil Building Service; L. L. Danielson, vice pres., Virginia Truck Exp. Sta.; Donald Schallock, treas., Rutgers Univ.

Entomology Research– Past and Future

By E. F. Knipling
Entomology Research Branch
Agricultural Research Service,
USDA

IN discussing the future of entomology research we must take into account the progress that has been made in the past. In other words, how solid is the foundation on which further progress can be built?

First, we must bear in mind that much of the information that has already been put into applied entomology will continue to serve the nation for centuries to come. In addition, we have a vast amount of basic knowledge on insects which has not yet been put into practice.

Prospects for making further outstanding progress are far greater

today than at any time in the past. On what basis are we justified in such optimism?

Our research personnel are better trained than ever before to undertake constructive research in both fundamental and applied entomology. The graduate entomologist today, in addition to being well grounded in entomology, obtains excellent basic training in supporting sciences so vital to entomology research, including chemistry, physiology, agronomy, horticulture, pathology and parasitology.

State, Federal and industrial institutions have better facilities and equipment for conducting research on the many phases of entomology.

Close cooperation on entomology research between Federal, state and industrial research institutions is being developed more each year. No better example of the trend in this direction can be cited than the establishment of the Brownsville, Tex., pink bollworm research laboratory where the Federal government, state experiment stations and the National Cotton Council are contributing funds and personnel for a coordinated research program to meet the threat of the world's worst cotton pest. Such close cooperation on the part of various agencies contributing to entomology research will accelerate the rate of progress in entomology.

We have already accumulated a vast amount of basic information on insects, even though new information on classification, morphology, physiology, life history, ecology and other biological aspects will always be necessary as we explore new ways to control them.

Support from Chemists

In the control of insects, entomologists are obtaining more and more support from chemists. Chemists have given us a number of outstanding insecticides, especially during the last decade. What these materials have meant to the farmer is evidenced by the millions of pounds of such chlorinated hydrocarbon insecticides as DDT, toxaphene, BHC, chlordane, aldrin, dieldrin and heptachlor employed annually to control the pests that destroy our growing crops, contaminate our stored products, annoy our livestock and attack and transmit diseases to man. Several organic phosphorus materials are coming into more extensive use.

In my opinion there exist almost unlimited possibilities for finding among these compounds insecticides that are not only highly effective but of low hazard to warm-blooded animals. Chemists cannot yet predict what type of chemicals will be insecticidally active, but they are making steady progress in that direction. I believe that in the not too-distant future the entomologist need only specify the type of compound desired for a specific pest and the insecticide chemist will produce it.

Systemics

Although better conventional insecticides are being found each year, systemic insecticides show unusual promise for meeting insect-control problems. I am confident that in time systemics will be employed extensively for controlling many insects attacking vegetables, fruits, cereal and forage crops and even insects attacking livestock. For the cotton grower I can think of no more hopeful chemical control measure than the use of systemic insecticides.

Outstanding progress has already been made in research on systemics during the last few years. What would it mean to the cotton farmer if through the simple process of treating seeds he could protect the plants for three months from attack by thrips, aphids, mites, fleahoppers, boll weevils, leafworms, pink bollworms and other pests? To my knowledge no chemical is known that will give such protection against these pests. Perhaps such a material will never be found, but certain materials now known will protect cotton against several of the pests for six to eight weeks.

From the progress that has been made with limited effort we have every reason to believe that entomologists, chemists and plant physiologists, working as a team, can achieve this goal, provided we obtain necessary support for an all-out research program on systemics.

Another important factor to consider in estimating the rate of progress in entomology research in the future is the ready acceptance of practical insect control measures in connection with the production and processing of agricultural products. Personnel in extension services are doing an excellent job in getting research information to the farmer. The increasing interest and demand from the public at large for more effective and more economical methods of meeting insect problems is stimulating research efforts. In this connection we should call attention to the very important role that entomologists can play in the future by intensifying research to provide more accurate information on which to forecast insect abundance. Such information to help determine when insect control measures are and are not necessary will be of great value to the grower as well as to industry.

Biological Warfare

The development of biological warfare utilizing insect diseases has been considered for many years. Although we cannot yet point to many effective and practical ways to utilize disease organisms for controlling destructive pests, the potentialities of this approach are indicated by the success of milky disease for controlling the Japanese beetle, a polyhedrosis virus for the alfalfa caterpillar, and another polyhedrosis virus for the European pine sawfly.

Important advances on this problem have been made during recent years. Research by the University of California, the Canadian government, the Entomology Research Branch and other institutions is yielding information on other virulent insect viruses and microorganisms. I personally feel that the use of disease organisms is one of the most promising means of controlling some of our most costly insect pests. We have sufficient encouragement to warrant making it one of the major research efforts in entomology.

Parasites and Predators

The utilization of disease organisms is of course only one of several biological-control methods that might be employed to control pests. The value of parasites and predators

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From a paper delivered before the 8th annual Cotton Insect Control Conference, Dallas, Tex., on December 8, 1954.

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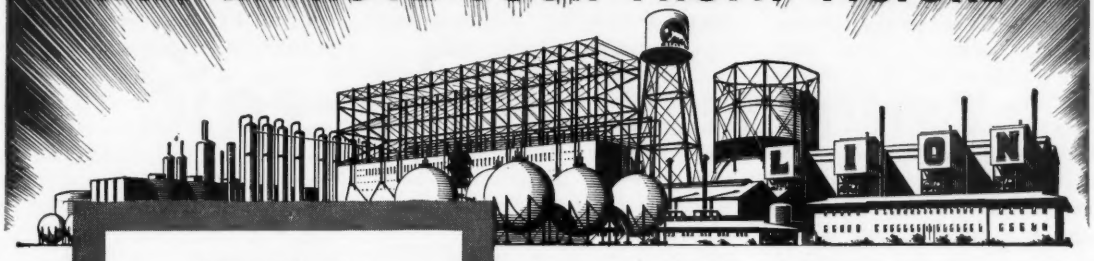

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in this respect was recognized many years ago, and we have a number of outstanding examples of success by importing these natural enemies. In our enthusiasm for developing more effective insecticides we must not overlook the role that parasites and predators can play in reducing insect losses, with very little cost to the producer.

The advantages of some of the highly active insecticides are frequently offset, in part at least, because of the destruction of beneficial insects. There is every reason to expect, however, that their adverse effects on beneficial insects can in time be greatly reduced through proper selection of insecticides and proper timing of treatments.

I was pleasantly surprised several months ago when I took a trip through the Cotton Belt and talked with a number of cotton farmers. They certainly do appreciate the value of beneficial insects. Several farmers were reluctant to apply insecticides lest they would destroy the lady beetles and other predators and parasites which keep some of our major cotton pests under control. We need to know more about the relationship between beneficial and destructive insects, so that we can give the farmer sound advice in the use of insecticides.

Another field of investigation which offers great opportunities for reducing losses is the development of insect resistance in plants. This method of control has been explored fairly well among cereal and forage crops, but far too little attention has been given to the development of resistant vegetables, fruits, cotton and ornamentals. This is a field of research that requires close cooperation and coordinated effort of entomologists and plant breeders in horticulture and agronomy.

The amount and rapidity of progress in all fields of entomology research will naturally be influenced by the degree and type of support that is obtained in state, Federal, and industrial institutions. In spite of the advances that have been made and the optimism I have expressed, there are many problems to be resolved if the desired progress will be attained.

Problems to be Resolved

We do not have practical ways to control a number of major pests. In this category I place the pink bollworm, the corn earworm in field corn, the tabanids, the wheat stem sawfly, a number of forest pests, the lesser corn stalk borer, the squash vine borer and the cyclamen mite on strawberries and ornamentals.

Many other important pests are being controlled but more economical means are urgently needed. This is true for the boll weevil, the European corn borer, the screwworm, the sugarcane borer, the codling moth, citrus scales, the Mexican fruit fly, the beet leafhopper and the cabbage aphid.

Entomology problems do not remain static. When new crops are introduced, and when new areas are opened to the production of crops, we are immediately faced with new insect problems. In spite of the good work of our Federal and state quarantine and pest control officials, insect pests will spread to new areas. Insects that normally feed on wild plants may change their food habits and attack cultivated crops. The destruction to cotton caused by the brown cotton leafworm in widely scattered areas in Texas for the past two years is an example. We now know that many pests have the ability to become resistant to certain insecticides. The effect of this phenomenon on future progress in entomology research cannot be estimated at this time, but it could be the most important factor limiting the success of chemical control measures.

Research Program Planning

To assure maximum efficiency in carrying out entomology research, the entomologists must plan their programs well and all aspects of the various programs must be coordinated. With funds and facilities available to them the entomologists must see that their research is properly balanced. More attention must be given to such basic research as insect physiology, mode of action of chemicals and nutritional requirements of insects. Adequate support must be provided for research on the classification of insects and on their biology and ecology. We must provide for proper balance of research effort on the various methods of control including chemical, biological, genetic and cultural. We must be constantly alert to the possibilities utilizing new methods—atomic irradiations, for example. The latest information on experiments on eradication of the screw-worm from specific areas by releasing reared gamma-ray-sterilized male flies among the wild population suggests that this unique method may be feasible for eradicating other insects that are present in small numbers at some period during the seasonal cycle. We haven't even begun to explore the possibilities in insect control by upsetting nutritional requirements of destructive pests.

There is obviously much that entomologists can and must do to assure properly balanced research programs. However, adequate support for the work of scientists in allied fields is also essential. In order to assure efficient and maximum progress in the use of insecticides there must be adequate research on their toxicity to man and animals. Adequate support is also necessary for chemical research to develop methods of detecting residues in foods and to carry out the routine analytical work required to insure that the use of insecticides on food crops does not lead to residues exceeding safe tolerances. Specialists in flavor evaluation should appraise the quality of food products treated with pesticides and plant physiologists and soils specialists should determine their effect on plants and soils, and wildlife specialists their effect on wildlife.

It is clearly apparent to the entomologist that research on such problems has not been adequately supported in the past. Unfortunately the need for such research has not been fully appreciated by others. The entomologist who is responsible for recommending insect-control practices realizes that he cannot escape the major share of the responsibility of assuring the public that the practices he recommends will not be hazardous. Yet he must depend on other specialists in various agencies for necessary research to make such assurances.

The toxicity and residue problem is a prime example of the need for appropriate authorities to arrange for properly balanced research programs between agencies. However, it is also important to provide for properly balanced programs on other investigations requiring joint

effort. For example, in the development of improved varieties of plants, appropriate attention should be given to insect resistance. In a broad study of animal and plant diseases, the role of insects in the transmission of diseases should be investigated. In efforts to control or eradicate noxious weeds and brush the value of insects and other organisms should be given due consideration.

In conclusion I should like to repeat that the science of entomology has served the farmer and the general public well during the last 100 years, and there is every reason to expect continued progress in the future. To make the desired progress, not only must research programs on the various aspects of entomology be developed and properly coordinated, but work in related fields must be adequately supported. Only in this way can we be sure of maximum progress in dealing with the thousands of insect pests that continue to threaten our agricultural economy, our health and comfort and the welfare of the nation as a whole. ◆

Sins of a Salesman

IN THE chemical industry today salesmen and purchasing agents have come to realize that despite the oppositeness of their jobs, they have much in common. Buyer and seller are sitting on opposite sides of the same desk. Evidently there are desirable qualities common to both which are easily and mutually understood. However, in order to improve the purchasing-sales relationship, both should be made aware not only of the factors which contribute to this association and which therefore should be acquired and improved upon, but they should be made aware of those traits that hinder and which, therefore, are to be avoided.

By G. F. Polzer
General Purchasing Agent
Chemical Raw Materials
American Cyanamid Co.

Two Types of Sins

It follows that there are two types of sins—those of commission and those of omission, and I would say they are of equal importance. Errors of commission are glaring errors, easily recognized. Errors of omission, however, do not come to light as vividly.

Hence, a salesman may feel that he is doing an excellent job because he has corrected his "sins of commission" not realizing that there are certain things he is not doing which, if overcome, would improve the purchasing-sales relationship immensely and would increase his effectiveness in selling.

Hundreds of thousands of words have been written, hours upon hours of oratory expended in sales meetings, thousands of dollars spent for sales training programs, all to emphasize the acts of commission which make for a good salesman. My worth to you is to give you from my experience what I have found to be "sins or errors of omission."

I feel that it is a common failing of many salesmen to spend too much of their time with buyers who are kindred souls and not necessarily good volume potential customers. The larger potential buyer may in some instances, I hate to confess, be less congenial; but if the salesman is to do an intelligent job, this should be unimportant. In some instances you will find the happy combination of the kindred purchasing agent who is a good volume potential customer. Even then, don't overplay your hand. There is a limit in the extent you can express your appreciation of his good nature—he could possibly have a larger expense account than you have.

Part of the Team

Many salesmen forget that they are just part of the company team. You have been selected by your company to represent it and to bring its name and products to the consumers. You are endowed with superb qualities of salesmanship, but the only way you can continue to merit the confidence of your customer is by rendering services in fact, commensurate with the services indicated by promises, and this can only be accomplished if the salesman has the complete backing of his home office and plant organizations. It is vitally important that the salesman be part of his team, well liked and popular with the people who back him up in the office and plant, if his customers are to receive the type of service that he has promised.

How many of you are really well

From a talk delivered before the Salesmen's Association of the American Chemical Society, New York City, on October 11, 1954.

acquainted with your inside or office sales people who process purchase orders, expedite shipment and insure quality? Do you know the men in charge of shipping, in charge of production, in charge of quality? Get to know them—sell yourselves to them; it isn't difficult to do. Little things mean a lot—a personal note of appreciation when a job is well done. Use what you have been taught in sales training; learn about their hobbies, their ambitions; appreciate their problems and they will appreciate yours. Then you will find teammates who will play the game with you right down to the last put-out. Perhaps the biggest factor in the sales-purchasing relationship is confidence in one another. If the purchasing agent is to have confidence in the salesman, the salesman must be fully posted on the activities of the industry he represents. This seems to be rather the exception than the rule.

Maintaining Confidence

The salesman may know his own products and can be technically well informed, but he often does not know when his competitor is coming in with increased production or when a new manufacturer is coming into the field, what his raw materials may be and consequently his manufacturing costs —all of which are important and should be discussed with the buyer if the customer's confidence is to be maintained.

I am sure that each of you has been embarrassed at least once by running into a purchasing agent who knows more about your company and the particular material in question than you do. Maybe this is due in part to a sin of omission by top sales personnel, sales managers and V. P.'s. Perhaps they don't keep their salesmen currently advised on company policies and market conditions.

A buyer's confidence in a salesman is greatly enhanced when he is kept informed on market conditions and trends and reasons for price changes. Here again I may appear too critical, but for some reason or other top sales management is extremely negligent in the scope of price change letters. It is a rare occasion when I receive a letter which expresses clearly and concisely the reasons behind a price change.

As a purchasing agent I can guarantee you that a good letter of this type makes buyers think often and long about the sender and thus the confidence of which we speak becomes stronger and stronger.

Another "sin of omission" is the lack of understanding some salesmen have of the buyer's responsibilities and viewpoint. Many salesmen ultimately lose the respect and confidence of the buyer by being too greedy and not recognizing that it is often the duty of the buyer when purchasing large volume items to divide the business in such a manner as to provide the maximum security for his company. This is particularly true where the salesman's organization has, from time to time, disappointed the purchaser.

We mentioned previously that a salesman should have complete knowledge of the products he is selling, his competition and market conditions affecting the price of these products; but a good salesman should go one step further. The only way a salesman can do an intelligent selling job over a period of time is to be posted in detail regarding the customer requirement of the product. It is not sufficient just to try to sell the material.

To become entirely and thoroughly acquainted with the customer's requirement is a somewhat arduous procedure, since to sit down and ask a lot of questions at one interview is often resented by the buyer who feels that the salesman is far too nosy. Therefore, if this information is to be developed intelligently, it must be procured over a period of interviews in a strategically planned manner so that in fact the buyer hardly realizes that the salesman ends up with as much information as he has.

One of the resaons why the salesman often never secures this detailed information so important to him is that he insists on doing all the talking and none of the listening.

Preparation

I regret to say that the majority of salesmen do not prepare their subject before making a specific call, nor do they plan their itineraries to get the maximum sales effort into the time which is so expensive to employers. Let us take the case of a specific sales call.

In many instances an appointment is not made ahead of time—this should be done as much as possible within the limits of practicability. Let us assume that the call is made without prior notice. How would you react to a salesman whose opening report was, "I just happened to be in the neighborhood so I thought I would drop in to see you; I don't have anything specific in mind, but I know you must buy a lot of chemicals, so there must be something I can sell you."? Sounds kind of ridiculous, but it's true.

How much better it would be to say, "While coming uptown I happened to read an advertisement by your company covering fly spray formulations. Many producers use malathion in these formulations, and there may be certain advantages in your use of our product." This approach is specific, and any purchasing agent who would resent an approach of this kind does not deserve to sit on that opposite side of the desk.

Extravagant Methods

In our industry, as in most others, the average age of a salesman today is such that he has really never operated under highly competitive conditions, although this is rapidly changing. This set of circumstances has brought about a rather extravagant method of operation and certainly of thought. For example, if a salesman is making a trip from New York to Chicago, he will leave his office at 3:30 p.m., take a 4:30 plane, arrive in Chicago at 7:30 p.m., arrive at his hotel at about 8:30, eat a big steak dinner and to bed. This same trip could be accomplished by leaving the office at 5:30, taking a train at 6:30, arriving in Chicago at 8:30 a.m., ready to go to work —result; no hotel expense.

The same thing is true in reverse, particularly at the end of the week. If the salesman finished up some distance from home and quit at 3 in the afternoon or earlier in order to be home for a 6:30 dinner, he loses considerable hours of selling or even possibly dining with a customer on Friday night. It is true by this method that he could not arrive home until nine or ten Sat-

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urday morning; but, after all, this is supposed to be what a salesman should do.

I think there is one thing that is overdone and that is the excessive use of the telephone. This grew out of wartime shortage periods when such telephoning was essential because nobody knew from almost one hour to another what material was available for shipment to the customer and what wasn't. Such is not the case today, but I am sure that the average chemical company's telephone bills are still the same as they were, if not more. In all fairness, I must admit that most purchasing men have this same failing, as evidenced by mounting administration purchasing expense. A little more letter writing would be in order, particularly since it provides a record.

I have attempted to give you some food for thought on some broad concepts. Now I would like to mention some specific factors which do not make a good salesman; these are the consensus of Cyanamid's purchasing people:

- The salesman who calls at about 9:00 or 9:15 a.m. or 4:15 to 4:30 p.m. without an appointment.
- The salesman who finishes his business; then talks and talks even when he sees the buyer is busy.
- One who blusters in, advises his prices can't be beaten, complains if he loses a quotation and keeps on letting everyone know about it.
- One who takes too much time to come to the point and is only a good handshaker.
- The salesman with an "I know the president or vice president" approach.
- The one who has nothing to say if he isn't primed.
- A salesman who does not recognize and concede defeat graciously if his product has no place or he is unable to meet competition.
- Dishonesty.
- Lack of imagination.
- Not speaking clearly and distinctly.
- Lack of respect for subordinates or other office personnel connected with the buying organization.
- Inability to temper approach to the peculiarities of the buyer.
- Trying to use pressure by going to higher officials.
- Divulging a company's confidential information to a competitive buying organization.
- Excessive entertainment.

Purchasing Agent's Sins

I would like to leave you with the impression, which you undoubtedly already have, that purchasing men also are remiss in many things. I have a consensus of some of my sales friends, and the six most repeated "sins of a purchasing agent" are

1. Lack of knowledge of end use of product.
2. Failure to give undivided attention. (There should be no interruptions. If a buyer is too busy for interview, he should be fair and suggest that the salesman return at some appointed time, provided buyer is interested in the product. If not interested, tell the salesman so.)
3. Failure to give salesman adequate information such as volume, delivery requirements and specifications.
4. Demanding or suggesting unreasonable or costly service.
5. Keeping waiting a salesman with definite appointment.
6. Not as honest with salesman as he should be, such as having tendency to distort facts on prices and services.

I cannot stress too strongly the mutuality of purchasing and sales and that in the future I hope that more and more purchasing and sales people will become cognizant of similarities in their endeavors. ◆

Double Duty Liquid N

FOR THE second straight year, the practice of using liquid nitrogen as both a fertilizer and weed killer has shown up well, according to reports by Glenn Klingman, weed control specialist and J. Clayton Davis, graduate student of North Carolina State College of Agriculture.

Mixture Used

Last year they used a mixture of 35 gallons liquid ammonium nitrate (solution 60), ¾ lb. Fab detergent and ⅛ lb. low-volatile ester 2,4-D to place 80 pounds nitrogen per acre. Two sprayings of 17½ gallons per acre each were applied, the first at about knee-high stage applied to the base of the corn stalks and to the middle of the row. The ammonium salt acted as a contact herbicide with the added two ingredients providing an extra weed killing punch.

At one location which received normal rainfall, weed control was decidedly better on the nitrogen solution plots than on cultivated areas. At three other places, under droughty conditions, cultivation looked better probably because the soil was too dry for weeds to sprout after lay-by cultivation.

Yields ranged from 10 to 98 bushels per acre depending on drought conditions, equalling. and in some liquid N plots, exceeding the 1953 yields.

Klingman and Davis suggest that on soils where 2,4-D is known to be effective, a 2,4-D pre-emergence spray be used, followed by one early cultivation and, at knee-high stage, two sprays of liquid nitrogen about one week apart.

Karmex D Safer for Corn

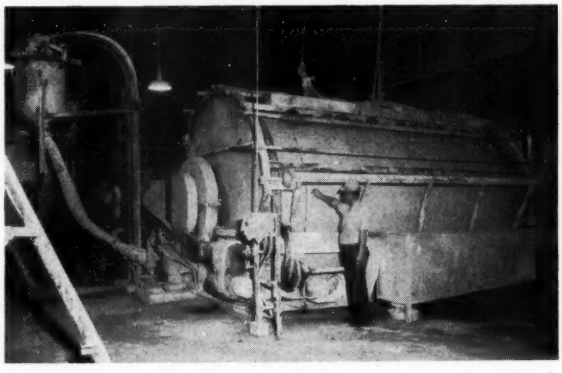
Karmex D, a DuPont offering, looked safer than 2,4-D on corn in comparative tests and, the specialists stated, give longer weed control. They caution that on land scheduled for tobacco the following year Karmex D should not be used because of a danger of stunting the tobacco crop. This product breaks down more slowly than 2,4-D in the soil. ◆

Aerial view of International Minerals & Chemicals corp's $15 million Bonnie phosphate chemicals plant.

New Products from Bonnie Plant

EXPANSION of facilities at the Bonnie, Fla., plant of International Minerals & Chemicals corp. to production of triple superphosphate and 0-50-0 Multi-Super pellets has materially increased the scope of products flowing from the giant works.

At the present time, one year after its opening, the Bonnie plant is turning out dicalcium phosphate for feed manufacturers (trade-named 20/FOS) and Dynafos, a beaded feed ingredient, in addition to the two fertilizer materials.



ABOVE: Drum filters used in the production of multiple superphosphate at the Bonnie phosphate chemicals plant.

BELOW: Huge building used for storage of triple super. It measures 600 by 300 feet, and its area encloses the equivalent of two football fields laid end to end.

The unit for recovery of uranium from phosphate solutions has already been well publicized. Although the raw material is of relatively low uranium content, the large volume treated offers the possibility of recovering a sizeable amount of the atomic energy source.

Timed to coincide with opening of the $15 million Bonnie plant was establishment of a separate Phosphate Chemicals division for IMC. In January, 1954, the former Phosphate division of the corporation was split into two units, with the Phosphate Chemicals division headed by Vice President Howard F. Roderick and a Phosphate Minerals division by Vice President George W. Moyers.

In addition to the Bonnie facilities, Roderick's division operates plants at Wales, Tenn., and Tupleo, Miss., both producing and selling phosphate chemicals. The Phosphate Minerals group is responsible for mining and refining phosphate ores in Florida and Tennessee.

Roderick comments that the fact triple superphosphate can be produced at Bonnie affords a greater flexibility to the installation, and the plant can be operated as market demand dictates. The powdery but dust-free texture of this 46 per cent APA material eliminates the need for grinding prior to mixing and also facilitates more complete ammoniation.

The 0-50-0 Multi-Super pellets are designed for direct soil application and are also considered ideal for range pasture application by airplane. BB-sized granules eliminate bridging and won't clog spreading equipment. ◆

by Dr. Melvin Nord

PATENT REVIEWS

Method and Compositions for Killing Weeds

In U.S. 2,695,839, issued Nov. 30, 1954, to John W. Kenney, Jr. and Joseph W. Gerard, and assigned to Great Lakes Carbon corp. (New York City), an aggregate containing an herbicidal agent is described, which is resistant to abrasion, crushing and to slacking when wet by water. The aggregate is intended to be distributed by aircraft over a designated area which is to be treated for the killing of weeds.

The desired physical properties are obtained by calcining at 1200–2000°F. diatomaceous earth particles of about 10 to 30 mesh size. This provides maximum resistance to abrasion, thereby preventing dusting during handling and application. It also improves the crushing strength and resistance to slacking by the action of water. The calcined aggregate has a strength about six times that of uncalcined diatomaceous earth, the abrasive resistance is about three times as good and the slacking loss in a test described in the patent was reduced from 13.6 to 0.0 per cent by calcining.

The calcined aggregate is impregnated with a solution of an herbicidal agent, such as the sodium salt of 2,4-D. About 5–10 per cent by weight of the herbicidal agent is used.

A second patent owned by the same company describes an alternative composition for accomplishing the same result. In U.S.-2,695,840, by Paul W. Leppla, calcined diatomaceous earth is replaced by pumice falling within the particle size ¼" to 50 mesh, and having a water absorption factor on a dry basis of at least 25 per cent by weight.

Method of Treating Seed-Potatoes for Checking Premature Sprouting

U.S. 2,695,841, issued Nov. 30, 1954, to Martinus Johannes Koopmans, and assigned to Hartford National Bank and Trust co. (Hartford, Conn.), discloses a new method of treating seed-potatoes to prevent premature sprouting during storage, without adversely affecting their ultimate germinating ability.

The seed potatoes are dressed with 1,1,2,3,3,4,5,5—octachlor-pentene–1.

The anti-sprouting agent may, if desired, be blended with a carrier or diluent such as talc powder. Tests proved that 20 to 80 mg. of the active material per kg. of potatoes yield the best result.

The octachloro-pentene may be prepared by reacting equimolecular weights of 1-dichloro 2-chloro 3-trichloro propene-1 with 1–2-dichloroethene using aluminum chloride as a reaction catalyst (See Fig. 1.).

The reaction develops a rather large amount of heat, which makes it necessary to keep the reaction temperature at about 10°C.

Fungicidal Products of Cellulose Ethers

According to U.S. 2,697,094, very active fungicidal products are obtained by reacting 1,2,4-trichloro-3, 5-dinitrobenzene with polyhydroxy compounds of high molecular weight or their ethers.

1,2,4-trichloro-3, 5-dinitrobenzene is readily obtainable by nitration of 1,2,4-trichlorobenzene which in turn is formed by splitting off hydrogen chloride from hexachlorocyclohexanes.

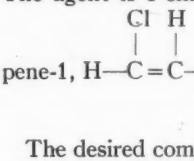
Suitable high molecular weight polyhydroxy compounds are polysaccharides such as cellulose, and their methyl, hydroxyethyl or glycollic acid ethers, the so-called "wood ether carboxylic acids," starch, pectic substances, inuline or polyvinyl alcohol.

The reaction takes place by mixing or kneading the reactants in the presence of solvents or diluents such as water or alcohols. The employment of acid-binding agents such as caustic alkali is necessary in order to combine with the hydrogen chloride formed.

The patent was issued Dec. 14, 1954, to Friedrich Becke and Oskar Flieg, and assigned to Badische Anilin—& Soda-Fabrik Aktiengesellschaft (Ludwigshafen am Rhine, Germany).

Soil Fumigant

U.S. 2,695,859, issued Nov. 30, 1954, to Frederick B. Hilmer, and assigned to Shell Development co., provides a toxic agent which, when introduced into soil, will kill fungi, bacteria, nematodes and weed seeds. The agent is 1-chloro-3-bromopropene-1,

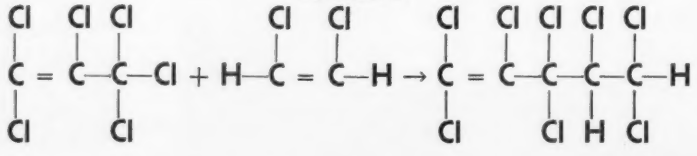


The desired compound is obtained by reacting 1,3-dichloropropene-1 with an alkali metal or alkaline earth metal bromide such as calcium bromide. For example, 1,3-dichloropropene-1 was stirred under reflux conditions with a molecular equivalent of powdered solid anhydrous calcium bromide for about 30 hours. The reflux kettle temperature was about 110–115°C. Thereafter, the resultant solid mixture of calcium chloride and calcium bromide in the reaction mixture was filtered off. The resultant liquid filtrate was distilled. A 49 per cent yield of 1-chloro-3-bromopropene-1, based on the initial amount of calcium bromide, was obtained.

The three preferred methods of application are (1) injection of the fumigant into the soil per se or in liquid solutions, (2) surface applications of water emulsions of the fumigant and (3) applications of the fumigant per se or in liquid solution, by a so-called "drip" technique.

The patent describes a considerable number of actual applications of the fumigant. ◆

FIGURE 1



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PEST REPORTS

Presented in cooperation with the Economic Insect Survey Station, Plant Pest Control Branch, Agricultural Research Service, USDA.

Yellow Clover Aphid on SW Alfalfa

The yellow clover aphid, Myzocallis trifolii (also called Therioaphis ononidis), which early in 1954 was first reported as being a serious pest of alfalfa, has remained active throughout the winter in the Southwest. Since the first report, which was from New Mexico, the aphid has appeared in and caused damage in Arizona, California, Nevada and Texas.

The pest, which last summer caused rather widespread damage in sections of Arizona, in January was still responsible for considerable damage to alfalfa in the Yuma area. This damage was particularly noticeable in new plantings and reseeded fields. Three nights of below freezing temperatures caused no noticeable decrease in the aphid population. In Graham county severe damage occurred during the early winter period, whereas in the summer, although a few aphids were noted, no damage was apparent.

The aphid was collected in California, first from burclover Feb. 7, 1954, at San Diego. Since that date serious infestations have occurred on alfalfa in San Diego, Imperial and Riverside counties. Light infestations were recorded from San Bernardino county in November and Los Angeles county in December. A single specimen was taken at Edison, Kern county, Jan. 25, 1955, making the first time the aphid had been taken north of Tehachapi mountains. This find was 60 miles north of the nearest previous location. The aphid has now been reported from Texas as damaging alfalfa. Positive identification has been made of specimens collected in Burleson county. Damage from aphids suspected of being this species has also been reported from the panhandle area and Maverick county.

Description

The yellow clover aphid is a whittish-yellow species about one-half the size of the pea aphid. It differs from the pea aphid in its feeding habits on alfalfa in that it forms colonies on the leaves usually on the underside of the older leaves, while pea aphid colonies are found mostly on the terminal portions of the stems. Damage consists of defoliation of the lower part of the plant and heavy production of honeydew which often supports the growth of sooty molds. Fields heavily infested may appear green before cutting but immediately after may be picked out by the blackened condition of the crowns. Alfalfa from infested fields is of inferior quality and where much honeydew is present, is impossible to dehydrate and difficult to cut and bale.

Loss Estimates

Estimates of losses made before the end of the growing season give an idea as to the damage the insect can inflict. In New Mexico losses were estimated at $4,000,000; Arizona losses, not counting decreased vigor and loss in seed production, were estimated at $500,000, and California losses were estimated at $337,900. Although no dollar damage was given by Nevada, many alfalfa fields in Clark county were severely damaged, especially those planted in the spring of 1954. Reduction of some stands amounted to more than 80 per cent.

Control Methods

Control of the yellow clover aphid by insecticides is evidently easy but reinfestation appears to be rather rapid. Although natural enemies were present in many fields they failed to cope with the problem. Control recommendations should be obtained from state and Federal agencies who can supply information on approved insecticides and rates of application. It is thought, however, that the following notes from the states confronted with the problem in 1954 might be interesting. In New Mexico the following insecticides were tried: DDT, malathion, parathion, BHC, Systox, nicotine, TEPP and sulfur alone or in combination with other insecticides. All of these gave excellent clean-up except DDT which was slow and erratic. Recommended materials in Arizona were: malathion, para-

Calendar

March 3-9—Idaho Plant Food meetings, sponsored by Univ. of Idaho; Couer d'Alene, March 3; Lewiston, 4; Boise, 7; Twin Falls, 8 and Idaho Falls, 9.

March 7-9—NACA Spring meeting Chase & Park Plaza hotel, St. Louis Mo.

March 8-9—Western Production conf. Hotel Westward Ho, Phoenix, Ariz.

March 22-24—National Farm Chemurgic Council annual conf., Columbus, O.

March 24-25—North Central States branch, ESA, meeting, East Lansing, Mich.

April 26—Third annual Calif. Fert. conf. sponsored by Soil committee, Calif. Fert. Assn. Univ. of Calif., College of Agr., Davis, Calif.

May 19—Fert. section, 25th annual North Carolina Safety conf., Robert E. Lee hotel, Winston Salem, N. C.

June 2—South Carolina Fertilizer meeting, Sandhill Experiment Sta., near Columbia, S. C.

June 3—Fertilizer section, Virginia State Safety Assn., Jefferson hotel, Richmond, Va.

June 12-15—Joint meeting, American Plant Food Council and National Fertilizer Assn., Greenbrier hotel, White Sulphur Springs, W. Va.

June 28-30—Sixth annual Pacific Northwest Plant Food Assn. Regional Fert. conf., Boise hotel, Boise, Idaho.

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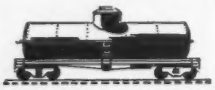

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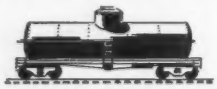

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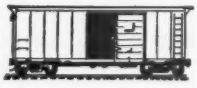

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thion, DDT, toxaphene and sulfur dust; and DDT and toxaphene spray. In California, parathion gave excellent results while very good results were reported from the use of malathion in Nevada.

'Hopper, Chinch Bug and Mormon Cricket Survey

The Grasshopper Control Project and cooperating state agencies conducted surveys during the fall of 1954 on grasshoppers, Mormon crickets and chinch bugs. Data obtained on these surveys have been compiled and the 1955 outlook for these pests released. Grasshopper infestations increased in cropland areas in many of the Mid-Western states. The surveys showed that the greatest increase in grasshopper populations took place in northern Indiana, southern Wisconsin, southern Iowa, the eastern portions of Nebraska and Kansas, Minnesota, Missouri and Oklahoma as well as parts of South Dakota, Texas and Utah. Preliminary estimates indicate that in 1955 some 6,000,000 acres of rangeland may require control in Arizona, California, Colorado, Kansas, Idaho, Montana, Nebraska, Nevada, New Mexico, Oregon, Oklahoma, Texas, Utah, Washington and Wyoming.

The chinch bug problem in 1955 is not expected to differ greatly from that of 1954 which caused damage to corn and sorghum in many local areas. Surveys made in the fall of 1954, after adults went into hibernation, show ratings of scattered, locally severe or very severe in northeastern Arkansas, east central Illinois, east central Kansas, northern Missouri and northeastern Oklahoma. Elsewhere in the states surveyed ratings ranged from non-economic to threatening. See map.

Mormon cricket infestations spread little, and the need for control should be less than in 1954. The greatest increase in infestations occurred in Montana. Small areas in Colorado, Idaho, Nevada, Utah and Wyoming will warrant control attention; however, the total area to be baited probably will not exceed 83,200 acres. ◆

Book Department

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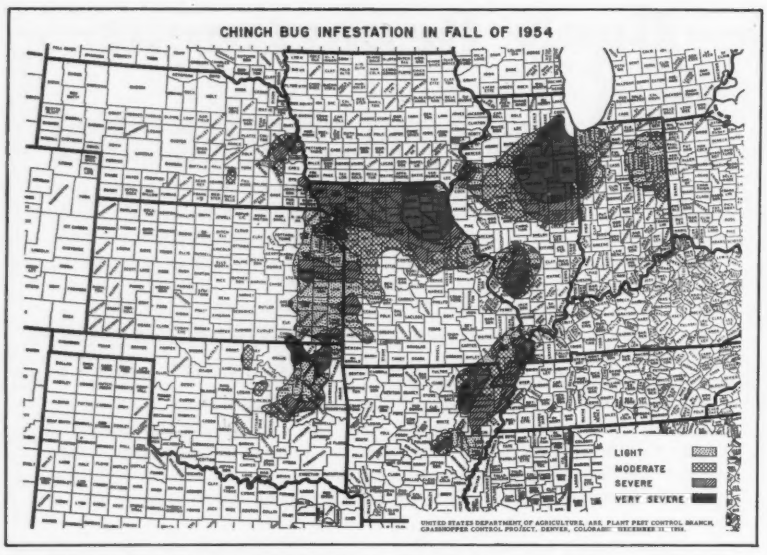

Literature

Commercial Fertilizers

Gilbert H. Collings has again revised *Commercial Fertilizers* with publication by McGraw-Hill of a fifth edition. This latest effort covers the important changes that have taken place in production and consumption of fertilizers in the seven years since the previous edition was released.

Much of the material is new, with many modifications made to conform to the latest findings of research in plant food production and use. Chapters cover the various nitrogen, phosphate, potash and trace element sources and Collings reviews the principles of purchase and use of fertilizers along with the application of both dry and liquid materials.

This fifth edition of *Commercial Fertilizers* can be obtained through the FARM CHEMICALS Book department at $8.00 per copy, postpaid. See page 59 for a convenient order coupon.

Statistics

1954 Fert. Mineral Production Equals '53

The all-time high production of fertilizer minerals achieved in 1953 was equalled in 1954, according to a report from the Bureau of Mines, Department of Interior. Phosphate rock production was about the same, and potash production increased 7 per cent.

The bureau stated that sulfur production increased moderately in '54, with supplies ample to satisfy demand and to permit producers to add to their stocks.

Super Shipments and Stocks Up in Nov.

Superphosphate shipments during November totaled 112,763 tons, a decrease of 6 per cent from the previous month's volume and an 18 per cent increase from the figure reported for November, 1953.

Stocks on hand at the end of November were 6 per cent more than those held on the first of the month and 8 per cent more than quantities on hand as of Nov. 30, 1953.

Production — November, 1954

Compiled from Government Sources

Chemical	Unit	November 1954	November 1953	October 1954
Ammonia, synth. anhydrous	s. tons	[1]238,463	195,552	230,098
Ammonia liquor, coal & coke (NH_3 content)	pounds	4,326,975	4,225,400	3,817,715
Ammonium nitrate, fert. grade (100% NH_4NO_3)	s. tons	156,561	121,384	142,833
Ammonium sulfate				
synthetic (technical)	s. tons	78,739	28,470	78,602
Coke oven by-product	pounds	145,658,322	151,325,900	139,479,338
BHC (Hexachlorocyclohexane)	pounds	2,035,910	———	1,829,999
Gamma content	pounds	320,910	———	337,999
Copper sulfate (gross)	s. tons	———	———	———
DDT	pounds	**6,459,354	———	5,525,628
2, 4-D Acid	pounds	———	———	———
esters & salts	pounds	**1,002,759	———	1,163,819
esters & salts (acid equiv.)	pounds	**818,882	———	905,977
Phosphoric acid (50% H_3PO_4)	s. tons	[1]261,207	217,175	245,893
Sulfur, Native (Frash)	l. tons	467,098	370,468	453,660
Recovered	l. tons	29,400	28,000	28,400
Sulfuric acid, gross (100% H_2SO_4)	s. tons	1,242,227	1,165,030	1,183,241
Chamber process (100% H_2SO_4)	s. tons	221,303	225,493	208,366
Contact process (100% H_2SO_4)	s. tons	1,020,924	939,537	974,875
Superphosphate (100% APA)	s. tons	191,631	161,878	*184,713
Normal (100% APA)	s. tons	136,110	125,116	*130,302
Enriched (100% APA)	s. tons	3,597	———	2,180
Concentrated (100% APA)	s. tons	50,896	35,713	*50,816
Wet Base (100% APA)	s. tons	1,028	1,049	*1,415

* Revised. ** Partly Estimated [1] Includes quantities for 1 plant previously not reporting.

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FERTILIZER MATERIALS MARKET

New York

February 14, 1955

Ammonium Nitrate. A better movement of ammonium nitrate is reported recently from various directions as some buyers want to be sure they will get all they need for the current season.

Nitrate of Soda. Stocks are ample to take care of expected demand and most buyers are holding off on deliveries until they actually need this material.

Urea. The importation of urea from abroad has declined in recent months because, domestic producers are now pretty much able to take care of buyers' requirements. Latest prices heard are $115 per ton at the ports with domestic prices unchanged and with one new producer about ready to enter the domestic market.

Nitrogenous Tankage. At the present time, offerings of nitrogenous tankage are rather difficult to locate because of the fact that most domestic producers are sold out for the current fertilizer year and production in some instances has declined. Very little imported material is available for quick shipment. This market at the present time is purely nominal.

Castor Pomace. Castor pomace, when available, is being sold at $37.50 per ton, f.o.b. domestic production points, with demand considered heavy because of the general shortage of organics. No recent offerings of imported castor pomace have been made.

Organics. There is more interest in organic fertilizer materials with the approach of the heavy shipping season and a good many organics were rather difficult to obtain for quick shipment. Blood was offered at $6.50 per unit of ammonia ($7.90 per unit N), f.o.b. New York, with animal tankage quoted at $6 per unit of ammonia ($7.29 per unit N), f.o.b. New York. Soybean meal was available at about $64 per ton, f.o.b. Decatur, Ill., in bulk. The feed trade limited their buying to their immediate needs. Linseed meal sold at $73 per ton in bulk, f.o.b. Buffalo, for prompt shipment. Cottonseed meal was slightly easier in price.

Fish Meal. The price for spot imported 60 per cent fish meal was about $147.50 per ton at Atlantic and Gulf ports. Very little is being used at the present time for fertilizer because of price.

Bone Meal. This material was in very limited supply for both feed and fertilizer buyers and has shown a steady upward trend in price, with recent prices noted for the imported feeding grade at about $75 per ton at the ports and practically no offerings of fertilizer bone meal.

Hoof Meal. This market is steady at $7 per unit of ammonia ($8.51 per unit N), f.o.b. Chicago and other production points. Offerings are not too plentiful.

Low Grade Organics. With most producers under contract, fill-in supplies were not readily available.

Superphosphate. There is not too much activity in this market at the present time as most buyers are under yearly contracts and have been able to obtain their entire requirements. Shipments are considerable, normal for this time of year, with no price changes noted.

Potash. The current hearing being held by Treasury officials in Washington regarding the so-called dumping of imported potash is being watched with keen interest by domestic buyers. In the meantime shipments of potash from the mines have improved considerably.

Philadelphia

February 14, 1955

While supplies of inorganics are still ample, buying interest is increasing and some delays in de livery are being encountered. Organics, however, are not so plentiful. Bone meal and castor pomace are almost unobtainable, while fish scrap is in limited supply, though the demand is not too active. Blood and tankage are in fairly good supply, with superphosphate and potash moving satisfactorily.

Sulfate of Ammonia. This is reported moving satisfactorily under improved inquiry, and former heavy stocks are being gradually reduced.

Nitrate of Ammonia. The demand is improved, with supply adequate and prices unchanged. The production is still ahead of last year.

Nitrate of Soda. This is moving better, particularly for top dressing. Prices are unchanged and stocks are ample for all requirements.

Blood, Tankage, Bone. Blood and tankage are in fairly good supply with the former at $6.50 to $7 per unit ammonia ($7.90 to $8.51 per unit N), and tankage at $5.75 to $6 ($6.99 to $7.29 per unit N) in the East and $6.75 to $7 ($8.20 to $8.51 per unit N) Chicago area. Bone meal is exceedingly scarce and nominal at $72.50 and over, per ton.

Castor Pomace. This is practically off the market and the quotation of $37.50 per ton is purely nominal.

Fish Scrap. The supply is quite limited, with the market firmer and higher. Menhaden meal is quoted at $150 per ton and scrap at $145 in the Baltimore area. Demand is rather slow.

Phosphate Rock. Supply is easier, though less heavy than previously, and inquiry is improving. Prices remain unchanged.

Superphosphate. Movement is said to be reasonably satisfactory with stocks fully able to meet the demand. The triple grade enjoys more activity than the normal grade. Prices are steady and unchanged.

Potash. Calls for delivery on contract are much improved, both for mixing and for direct application. Prices remain unchanged.

CF&I officials M. P. Drummond, manager of coke sales, Frank P. Jasper, manager of chemical sales and Kenneth B. Stuart, general manager of chemical, coke and fuel sales, examine DAP bags loaded in box-car.

CF&I Producing DAP

TAKING a new approach to the fertilizer industry, Colorado Fuel & Iron corp. has begun marketing high analysis diammonium phosphate. Trade-named DAP, the 21–53–0 material is being produced through a revolutionary technological development, according to K. O. Stuart, general sales manager of the organization's chemical, coke and coal divisions.

First to Make the Move

CF&I is believed to be the first major coke oven operator to make the move away from by-product ammonium sulfate. Unavailability of a proper grade of phosphoric acid has usually prevented such a development in the past.

Now, at the company's Pueblo, Colo., coke oven plant, ammonia, instead of being removed from oven gases with sulfuric acid, is scrubbed with electric furnace phosphoric acid. Development of the process was aided by technical collaboration with Monsanto Chemical co. and Koppers co.

Practicability Proven

Practicability of the new method was proven in full scale production tests during the summer of 1954, and the company began immediately the plans for permanent changes in facilities to permit large scale operations in time for the spring fertilizer rush.

Current marketing plans include coverage of the entire western half of the country. Stuart comments that the extremely high analysis of DAP and resultant savings in shipping costs are expected to make the product economically advantageous in many new areas.

As marketed by CF&I, DAP is free flowing and readily soluble, can be used in irrigation water, with sprinkler irrigation systems, in liquid applicators or in conventional dry spreaders. ◆

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editorial

Tolerance Regulations

GENERAL regulations for setting tolerances and for granting exemptions are now a matter of record published in the February 4 issue of the FEDERAL REGISTER as noted by John Harms in this issue. It is gratifying to note that in many cases the views of industry and the National Agricultural Chemicals Association have been taken into consideration.

Many of the changes made prior to final publication were in line with the recommendations described in our last issue.

There is one section which may well be a prime subject for discussion at the St. Louis meetings of NAC association, the paragraphs of 120.33 that relate to the costs of advisory committees. As the rules and regulations have been set up, the entire costs of these groups will be met by the petitioner—fees to committee members (including traveling and subsistence expenses), expenses of the secretariat and the cost of duplication documents referred to the committee.

An advance deposit of $2,500 is required plus further advances of $2,500 each upon request of the commissioner "when necessary to prevent arrears in the payment of such costs."

From here it would seem that the work of an advisory committee is of benefit not only to the pesticide manufacturer, but to the government and to the public as well. Perhaps additional thought should be given to a more equitable method of paying for the services of these advisory committees.

Industry is already submitting applications for tolerances to the Food and Drug Administration, following the lead of Union Carbide & Carbon corp.

George P. Larrick, FDA commissioner, has suggested that such petitions be filed promptly, adding that the agency wishes "to help all those who market pesticide chemicals to prepare for the new law before it becomes fully effective." FDA has also reported that any actions taken in compliance with the tentative regulations will be regarded as complying with the law.

BDSA Forecast

ANOTHER big year for the chemical industries is forecast by the Business and Defense Services Administration. It sees total sales of some $21 billion, about four per cent over 1954, production increasing to a similar level and capital expenditures for plants and equipment just below the 1954 level, about $1,200 million.

Fertilizer movement this spring is expected to reach another record peak, and consumption for the 1954–55 fertilizer year should exceed last year's total. The agency reports that the expected high in spring shipments could severely tax transportation facilities.

BDSA states that during the last half of 1954 fertilizer consumption was actually four per cent higher than in the corresponding 1953 period.

COMMENTING on the nitrogen situation, BDSA cited evidence of an off-season decline in production last summer, a reduction that appears more drastic when compared with total capacity bolstered during the last half of 1954 by several new plants. A record output of ammonia is expected, along with higher production of ammonia derived materials such as ammonium nitrate, ammonium sulfate and urea.

No effort was made by BDSA to predict the level of nitrogen imports for the year, but because of the increased domestic capacity this should be below the 440,000 N ton level of 1953–54.

Reviewing superphosphate production and shipment figures, BDSA reports that seasonal variations in production have become much more pronounced during the past two years than was the case in the immediately preceding periods. "The improved supply position," the report continues, "has undoubtedly contributed to this trend because of the tendency for last minute buying when there are no shortages."

Use of phosphoric acid for direct application is also mentioned with the prediction that this will "account for a substantial part of any increased use of phosphorus in 1955, especially in the far west."

On the pesticides front, BDSA forecasts increased production and use of these materials with output generally expected to follow the overall upward trend. There is, however, no certainty of a continuation of government activity in furnishing pesticides for foreign pest control programs, although such activities may be carried into 1955.

The industry, BDSA continues, anticipates participation in foreign markets to an equal or greater extent during the year.

G. P. T., JR.
Editor

Chemicals

83—American Nitrate

A new style of Arcadian American nitrate of soda is now being offered by Nitrogen division. Improved physical condition results from a new process which produces big, triple-screened crystals. For information

CIRCLE 83 ON SERVICE CARD

84—Moly Testing

Climax Molybdenum has available a bulletin on testing for molybdenum deficiency. The company points out that moly can be applied to deficient soils in fertilizer mixtures, sprays or on seed. A number of states have already reported soils deficient in this element.

CIRCLE 84 ON SERVICE CARD

85—IMC Triple Super

Mixing costs can be cut with IMC triple superphosphate which features improved particle size and fine, virtually dust-free texture. It cuts down the need for premix grinding, assures faster and more complete ammoniation and promotes better granulation. For samples and quotations

CIRCLE 85 ON SERVICE CARD

86—Sell Cyanamid

American Cyanamid says that profits can be added to your operation with Aero cyanamid. Since the material is leach resistant, it can aid in building off-season sales. For free information

CIRCLE 86 ON SERVICE CARD

87—Davison Triple Super

You can meet the demand for high analysis goods with 45/46 per cent APA Davison triple superphosphate. The material is supplied in easy to use granulated form or run-of-pile. For complete information

CIRCLE 87 ON SERVICE CARD

88—Fly Bait

Geigy's Diazinon Fly Bait is now recommended for use in dairy barns. Diazinon offers rapid kill and long residual action, and it is economical—one pound treats 12–16,000 sq. ft. of floor space. If you are interested in acting as a distributor of this new pesticide formulation

CIRCLE 88 ON SERVICE CARD

89—Herbicide Manual

Emulsol has issued a new technical bulletin, a formulators' manual of herbicide formulations. It covers the latest emulsifier recommendations for high and low vol 2,4-D and 2,4,5-T esters and carbamate herbicides. For your copy

CIRCLE 89 ON SERVICE CARD

FREE INFORMATION to help you solve fertilizer, pesticide problems

Reader Service

90—Uniform Solvents

High boiling, uniform Nevsolv solvents from Neville Chemical assist you by promoting the ease of formulation at low cost. They are active solvents for pesticides such as DDT, BHC, 2,4-D esters, etc. For samples

CIRCLE 90 ON SERVICE CARD

91—Pesticide Digest

Do you receive the ATTACLAY PESTICIDE DIGEST as issues are released by the Attapulgus division? These informative sheets discuss various aspects of pesticide problems and could prove beneficial. To be placed on the mailing list, formulators can

CIRCLE 91 ON SERVICE CARD

How to use the READER SERVICE CARD

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92—Fairfield Pyrenone

Pyrenone from Fairfield Chemical, the versatile combination of pyrethrins and piperonyl butoxide, fills a wide range of requirements and is safe, effective and economical. For full details on this insecticide material

CIRCLE 92 ON SERVICE CARD

93—Monamines

A revised folder has been released by Mona Industries on its line of Monamine surface active agents. Included are specifications on the basic grades with chemical, physical and physiological properties of the entire line.

CIRCLE 93 ON SERVICE CARD

Materials Handling

94—Clark Leases

Michigan tractor shovels from Clark Equipment are available under a leasing plan. These units feature a power shift transmission that eliminates the foot clutch and are equipped with forward-reverse and high-low hand levers on the steering column. Shifts can be made while moving in any direction. For full details on the lease plan

CIRCLE 94 ON SERVICE CARD

95—L-B Catalog

Some of you may not yet have obtained a copy of the Link-Belt standard products catalog, a 340 page guide to L-B power transmission and conveying equipment. The indexed catalog can be a big help in selecting standard products for replacement or new installations. To get a copy, manufacturers can

CIRCLE 95 ON SERVICE CARD

96—Industrial Trucks

Magcoa offers a new data file describing its aluminum industrial trucks. Included are specifications for various styles of flatbed, multiple deck and A-frame trucks and information on the various available accessories.

CIRCLE 96 ON SERVICE CARD

Process Equipt.

97—Rotocycle Meters

Rockwell Rotocycle stainless steel industrial meters for handling of fertilizer solutions and other corrosives are described in a new booklet. Included is information on the Rotocycle principle, remote registration, quantity control and construction features of the meters.

CIRCLE 97 ON SERVICE CARD

98—Whirlwind Air Separator

The widely used Sturtevant Whirlwind air separator is especially designed to pick off classified materials. A continuously uniform product of desired fineness is selected, and the units increase production and cut power costs in a closed circuit with grinding mills. For further information

CIRCLE 98 ON SERVICE CARD

99—Renneburg Equipment

A recent catalog describes the line of processing equipment produced by Edw. Renneburg & Sons. Included is information on rotary coolers for fertilizer production, fines recovery systems, rotary dryers, pollution control and the new Dehydro-Mat.

CIRCLE 99 ON SERVICE CARD

100—Liquid Controls

Free from the limitations of mechanical or electrical controls, Magentrol liquid level controls have infinite operating life with a minimum of maintenance. Basic operation involves a sleeve raised and lowered within a non-magnetic tube attracting or releasing an Alnico magnet attached to a mercury switch. For a catalog and full information

CIRCLE 100 ON SERVICE CARD

101—Pumps & Valves

Durco pumps, valves, heat exchangers and acid proof drain pipe help lick severe corrosion problems in the handling of sulfuric acid, waste acid solutions and nitrate solutions. A catalog describes the company's alloys and equipment.

CIRCLE 101 ON SERVICE CARD

102—Plant Equipment

The latest in processing and handling equipment, plus Link-Belt 'turn-key' service, is described in the company's fertilizer plant and equipment book. Included are flow sheets on ammonium nitrate, superphosphate and granulated mixed fertilizer processes.

CIRCLE 102 ON SERVICE CARD

Packaging

103—Palletized Bags

A 10 page bulletin has been issued by Arkell & Smiths on palletizing filled multiwall bags. Included are detailed drawings and useful ideas and suggestions to facilitate handling, shipping and adapting bags now being used, to fit a given pallet.

CIRCLE 103 ON SERVICE CARD

104—USS Drums

United States Steel offers a full-color brochure on USS scale free, rust-inhibited drums. The surfaces of these shipping containers are physically and chemically clean and covered with an effective rust-inhibiting coating. The company fabricates stainless, galvanized, tinned, painted and decorated drums and pails in capacities from 2— to 110 gallons.

CIRCLE 104 ON SERVICE CARD

105—Preform Multiwalls

You can increase profits with Preform multiwall bags, according to International Paper. The special crease makes bag forming easier, speeds bag closing, insures better filling and produces a better looking package. You can package more tonnage with less waste. For complete information and prices

CIRCLE 105 ON SERVICE CARD

106—Bennett Hi-Bake

Bennett Industries produces lined pails with Hi-Bake linings that safely contain pesticide formulations. Single and multiple coat linings are applied with extreme care to provide double protection for hard to handle products. Information is available.

CIRCLE 106 ON SERVICE CARD

107—Disposable Aerosols

Disposable containers for insecticide aerosols are increasing in popularity, according to Tube Manifold. The company produces cylindrical containers combining low cost, light weight and compact size ranging in sizes from 3 to 6 inch diameters and lengths to 30 inches. For complete information

CIRCLE 107 ON SERVICE CARD

Miscellaneous

108—Butler Tanks

Butler Mfg. offers welded, aluminum, low pressure tanks in 12 and 22,000 gallon capacities and 22,000 gal. bolted vertical non-pressure units. The welded units are horizontal tanks available to code specifications. Complete information is available.

CIRCLE 108 ON SERVICE CARD

109—Sell Tanks

Companies interested in handling NH_3 tanks for resale to the farmer or custom applicator will be interested in Flint Steel units. These tanks have longer service life and are shipped dry and complete with pressure gauge and positive hand shut off valves on vapor filler and liquid outlet. For a folder on what to look for when considering the sale of such tanks

CIRCLE 109 ON SERVICE CARD

110—InsectoJet

Spraying Systems has added the InsectoJet sprayer to its line following acceptance in the Wisconsin dairy area. A bottle type, compressed air unit, it will completely cover a 60 foot dairy barn with a highly atomized spray in about two minutes. A bulletin is available.

CIRCLE 110 ON SERVICE CARD

111—Transite

You save money on construction and maintenance when you build with corrugated Transite, says Johns Manville. Practically indestructable, the material is fireproof, rotproof and weatherproof. For complete details

CIRCLE 111 ON SERVICE CARD

112—BoomJet

For broadcast spraying of grains, grasses and liquid fertilizers, Spraying Systems offers BoomJet spray nozzles. These units cover a swath up to 66 feet wide and are easily mounted on the rear of a tractor for use where spray boom accuracy is not needed. Available in aluminum for liquid fertilizers, brass for general use. For a bulletin

CIRCLE 112 ON SERVICE CARD

113—Safe Lighting

Benjamin Electric produces explosion proof lighting units for use where explosive atmospheres or inflammable dust is found. Available in a choice of four reflectors and a variety of mountings, they are designed for locations listed by U.L. as Class 1 groups C and D. For a descriptive manual

CIRCLE 113 ON SERVICE CARD

114—Steel Grating

Where acids and corrosion is a problem, Kerrigan Iron Works stainless steel grating and stair treads stand up under severe punishment. They are fabricated to be free of any acid-trap rivets or notches, and the producer offers a complete custom service. For detailed information

CIRCLE 114 ON SERVICE CARD

See the Industry News section, pages 7-22-23 for information on these Reader Service numbers—

115—Nutro Distributors
116—Stauffer Vapam
117—Flo Mix Applicator
118—Safety Suits
119—Lamo-Pak
120—NH_3 Vapor Pump
121—Epoxy Coatings

Buyers' Guide

Classified Index to Advertisers in 'Farm Chemicals'

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Pittsburgh Coke & Chem. Co., Agr. Chem. Div., Pittsburgh, Pa.
Shell Chemical Co., Agr. Chem. Div., Denver, Colo.

AMMONIA—Anhydrous and Liquor

Commercial Solvents Corporation, New York City
Grand River Chem. Div., Deere & Co., Tulsa, Okla.
Lion Oil Co., El Dorado, Ark.
Nitrogen Div., Allied Chemical & Dye Corp., N.Y.C.
Phillips Chemical Co., Bartlesville, Okla.
U. S. Industrial Chemicals, New York City

AMMONIA APPLICATORS

KBH Corp., Clarksdale, Miss.

AMMONIUM NITRATE

Ashcraft-Wilkinson Co., Atlanta, Ga.
Commercial Solvents Corporation, New York City
Lion Oil Co., El Dorado, Ark.
Phillips Chemical Co., Bartlesville, Okla.

AMMONIUM PHOSPHATE

Monsanto Chem. Co., St. Louis, Mo.

AMMONIUM SULFATE

See Sulfate of Ammonia

BAGS—Multiwall-Paper

International Paper Co., Bagpak Div., N. Y. C.
Hammond Bag & Paper Co., Wellsburg, W. Va.
Kraft Bag Corporation, New York City
Union Bag & Paper Corp., New York City

BAGS—Dealers and Brokers

Ashcraft-Wilkinson Co., Atlanta, Ga.
McIver & Son, Alex. M., Charleston, S. C.

BAG CLOSING MACHINES

International Paper Co., Bagpak Div., N. Y. C.

BAG PRINTING MACHINES

Schmutz Mfg., Louisville, Ky.

BAG FILLING MACHINES

Stedman Foundry and Machine Co., Aurora, Ind.
Union Bag & Paper Corp., New York City

BHC AND LINDANE

Ashcraft-Wilkinson Co., Atlanta, Ga..
Diamond Alkali Co., Newark, N. J.
Pennsylvannja Salt Mfg. Co., of Wash., Tacoma, Wash.
Pittsburgh Coke & Chem. Co., Agr. Chem. Div. Pittsburgh, Pa.

BONE PRODUCTS

American Agricultural Chemical Co., N. Y. C.
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Bradley & Baker, N. Y. C.
Jackle, Frank R., New York City
Woodward & Dickerson, Inc., Philadelphia, Pa.

BORAX AND BORIC ACID

American Potash & Chemical Corp., Los Angeles, California
Woodward & Dickerson, Inc., Philadelphia, Pa.

BROKERS

Ashcraft-Wilkinson Co., Atlanta, Ga.
Bradley & Baker, N. Y. C.
Jackle, Frank R., New York City
Keim, Samuel D., Philadelphia, Pa.
McIver & Son, Alex. M., Charleston, S. C.
Woodward & Dickerson, Inc., Philadelphia, Pa.

BULK TRANSPORTS

Highway Equipment Co., Cedar Rapids, Ia.

CALCIUM ARSENATE

American Agricultural Chemical Co., N. Y. C.

CARS AND CART

Atlanta Utility Works, The, East Point, Ga.
Stedman Foundry and Machine Co., Aurora, Ind.

CASTOR POMACE

Ashcraft-Wilkinson Co., Atlanta, Ga.
McIver & Son, Alex. M., Charleston, S. C.

CHEMISTS AND ASSAYERS

Shuey & Co., Inc., Savannah, Ga.

CHLORDANE

Ashcraft-Wilkinson Co., Atlanta, Ga.
Pittsburgh Coke & Chem. Co., Agr. Chem. Div., Pittsburgh, Pa.

CLAY

Ashcraft-Wilkinson Co., Atlanta, Ga.

CONDITIONERS

Ashcraft-Wilkinson Co., Atlanta, Ga.
Jackle, Frank R., New York City
Keim, Samuel D., Philadelphia, Pa.
McIver & Son, Alex. M., Charleston, S. C.
National Lime & Stone Co., Findlay, Ohio

CONVEYORS

Power-Curve Conveyor Co., Denver, Colo.
Link-Belt Co., Chicago, Ill
Stedman Foundry and Machine Co., Aurora, Ind.
Sturtevant Mill Co., Boston, Mass.

COPPER SULFATE

Tennessee Corp., Atlanta, Ga.

COTTONSEED PRODUCTS

Ashcraft-Wilkinson Co., Atlanta, Ga.
Bradley & Baker, N. Y. C.
Jackle, Frank R., New York City
Woodward & Dickerson, Inc., Philadelphia, Pa

CUSTOM PESTICIDE FORMULATION

Barco Chemicals, Inc., Des Moines, Ia.

DDT

Ashcraft-Wilkinson Co., Atlanta, Ga.
Diamond Alkali Co., Newark, N. J.
Pittsburgh Coke & Chem. Co., Agr. Chem. Div., Pittsburgh, Pa.

DIELDRIN

Ashcraft-Wilkinson Co., Atlanta, Ga.
Pittsburgh Coke & Chem. Co., Agr. Chem. Div., Pittsburgh, Pa.
Shell Chem. Corp., Agr. Chem. Div., Denver, Colo.

DILUENTS

Ashcraft-Wilkinson Co., Atlanta, Ga.
Pioneer Pyrophyllite Producers, Beverly Hills, Calif.
Pittsburgh Coke & Chem. Co., Agr. Chem. Div., Pittsburgh, Pa.
Summit Mining Corp., Carlisle, Pa.
Thomas Alabama Kaolin Co., Baltimore, Md.

DITHIOCARBAMATES

Berkshire Chemicals, New York City

DUST APPLICATORS

Raw Materials Trading Co., New York City

ELEVATORS

Power-Curve Conveyor Co., Denver, Colo.
Link-Belt Co., Chicago, Ill.
Stedman Foundry and Machine Co., Aurora, Ind.

ENGINEERS—Chemical and Industrial

Chemical Construction Corp., New York City
Marietta Concrete Corporation, Marietta, Ohio
Stedman Foundry and Machine Co., Aurora, Ind.
Sturtevant Mill Co., Boston, Mass.

FERTILIZER—Liquid

Clover Chemical Co., Pittsburgh, Pa.

FERTILIZER—Mixed

American Agricultural Chemical Co., N. Y. C.
Armour Fertilizer Works, Atlanta, Ga.
Davison Chemical Co., div. of W. R. Grace & Co., Baltimore, Md.
International Min. & Chem. Corp., Chicago, Ill.

FILLERS

Bradley & Baker, N. Y. C.

FISH SCRAP AND OIL

Ashcraft-Wilkinson Co., Atlanta, Ga.
Bradley & Baker, N. Y. C.
Jackle, Frank R., New York City
Woodward & Dickerson, Inc., Philadelphia, Pa.

FULLER'S EARTH

Ashcraft-Wilkinson Co., Atlanta, Ga.

FUNGICIDES

American Agricultural Chemical Co., N. Y. C.
Berkshire Chemicals, New York City
Pittsburgh Coke & Chemical Co., Agr. Chem. Div. Pittsburgh, Pa.
Tennessee Corp., Atlanta, Ga.

HERBICIDES

American Potash & Chemical Corp., Los Angeles, California
Barco Chemicals, Inc., Des Moines, Ia.
Diamond Alkali Co., Newark, N. J.
Lion Oil Company, El Dorado, Ark.
Pittsburgh Coke & Chem. Co., Agr. Chem. Div. Pittsburgh, Pa.

HERBICIDES—Oils

Lion Oil Company, El Dorado, Ark.

HOPPERS & SPOUTS

Stedman Foundry and Machine Co., Aurora, Ind,
Sturtevant Mill Co., Boston, Mass.

IMPORTERS, EXPORTERS

Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Berkshire Chemicals, New York City
Woodward & Dickerson, Inc., Philadelphia, Pa.

INSECTICIDES

American Agricultural Chemical Co., N. Y. C
American Potash & Chemical Corp., Los Angeles, California
Ashcraft-Wilkinson Co., Atlanta, Ga.
Barco Chemicals, Inc., Des Moines, Ia.
Berkshire Chemicals, New York City
Diamond Alkali Co., Newark, N. J.
Fairfield Chem. Div., Food Mach. & Chem. Corp., New York City
Pennsylvanna Salt Mfg. Co., of Wash, Tacoma, Wash.
Pittsburgh Coke & Chem. Co., Agr. Chem. Div. Pittsburgh, Pa.
Shell Chem. Corp., Agr. Chem. Div., Denver, Colo.

IRON SULFATE

Tennessee Corp., Atlanta. Ga.

KAOLIN

Thomas Alabama Kaolin Co., Baltimore, Md.

LEAD ARSENATE

American Agricultural Chemical Co., N. Y. C.

LIMESTONE

American Agricultural Chemical Co., N. Y. C.
Ashcraft-Wilkinson Co., Atlanta, Ga.
National Lime & Stone Co., Findlay, Ohio

MACHINERY—Acid Making and Handling

Chemical Construction Corp., New York City
Monarch Mfg. Works, Inc., Philadelphia, Pa.
Stedman Foundry and Machine Co., Aurora, Ind.
Sturtevant Mill Co., Boston, Mass.

MACHINERY—Acidulating

Chemical Construction Corp., New York City
Stedman Foundry and Machine Co., Aurora, Ind.

MACHINERY—Grinding and Pulverizing

Bradley Pulverizer Co., Allentown, Pa.
Poulsen Co., Los Angeles, Calif.
Stedman Foundry and Machine Co., Aurora, Ind.
Sturtevant Mill Co., Boston, Mass.

Buyers' Guide

MACHINERY—Material Handling

Clark Equipt. Co., Construction Mach. Div., Benton Harbor, Mich.
Hough, The Frank G. Co., Libertyville, Ill.
Jaeger Machine Co., Columbus, O.
Link-Belt Co., Chicago, Ill.
Poulsen Co., Los Angeles, Calif.
Power-Curve Conveyor Co., Denver, Colo.
Sauerman Bros. Inc., Chicago, Ill.
Stedman Foundry and Machine Co., Aurora, Ind.
Sturtevant Mill Co., Boston, Mass.

MACHINERY—Mixing, Screening and Bagging

Poulsen Co., Los Angeles, Calif.
Stedman Foundry and Machine Co., Aurora, Ind.
Sturtevant Mill Co., Boston, Mass.

MACHINERY—Power Transmission

Link-Belt Co., Chicago, Ill.
Stedman Foundry and Machine Co., Aurora, Ind.

MACHINERY

Superphosphate Manufacturing

Link-Belt Co., Chicago, Ill.
Stedman Foundry and Machine Co., Aurora, Ind.
Sturtevant Mill Co., Boston, Mass.

MAGNESIUM SULFATE

Berkshire Chemicals, New York City

MANGANESE SULFATE

Tennessee Corp., Atlanta, Ga.

MANURE SALTS

Potash Co. of America, Washington, D. C.

MINOR ELEMENTS

Tennessee Corporation, Atlanta, Ga.

MIXERS

Atlanta Utility Works, The, East Point, Ga.
Stedman Foundry and Machine Co., Aurora, Ind.
Sturtevant Mill Co., Boston, Mass.

NITRATE OF POTASH

Berkshire Chemicals, New York City

NITRATE OF SODA

American Agricultural Chemical Co., N. Y. C.
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Bradley & Baker, N. Y. C.
McIver & Son, Alex. M., Charleston, S. C.
Nitrogen Div., Allied Chemical & Dye Corp., N.Y.C.
International Min. & Chem. Corp., Chicago, Ill.
Woodward & Dickerson, Inc., Philadelphia, Pa.

NITROGEN SOLUTIONS

Commercial Solvents Corporation, New York City
Nitrogen Div., Allied Chemical & Dye Corp., N.Y.C.
Lion Oil Company, El Dorado, Ark.
Phillips Chemical Co., Bartlesville, Okla.

NITROGEN MATERIALS—Organic

American Agricultual Chemical Co., N. Y. C.
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Bradley & Baker, N. Y. C.
International Min. & Chem. Corp., Chicago, Ill.
Jackle, Frank R., New York City
McIver & Son, Alex. M., Charleston, S. C.
Smith Rowland Co., Norfolk, Va.
Woodward & Dickerson, Inc., Philadelphia, Pa.

NOZZLES—Spray

Monarch Mfg. Works, Philadelphia, Pa.
Spraying Systems Co., Bellwood, Ill.

PARATHION

Ashcraft-Wilkinson Co., Atlanta, Ga.
Pittsburgh Coke & Chem. Co., Agr. Chem. Div., Pittsburgh, Pa.

PHOSPHATE ROCK

American Agricultural Chemical Co., N. Y. C.
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Bradley & Baker, N. Y. C.
International Min. & Chem. Corp., Chicago, Ill.
McIver & Son, Alex. M., Charleston, S. C.
Woodward & Dickerson, Inc., Philadelphia, Pa.

PHOSPHORIC ACID

American Agricultural Chemical Co., N. Y. C.

PLANT CONSTRUCTION—Fertilizer and Acid

Atlanta Utility Works, The, East Point, Ga.
Chemical Construction Corp., New York City
Link-Belt Co., Chicago, Ill.
Stedman Foundry and Machine Co., Aurora, Ind.
Sturtevant Mill Co., Boston, Mass.

POTASH—Muriate

American Potash & Chemical Corp., Los Angeles, California
Ashcraft-Wilkinson Co., (Duval Potash) Atlanta, Ga.
Bradley & Baker, N. Y. C.
Duval Sulphur & Potash Co., Houston, Tex.
International Min. & Chem. Corp., Chicago, Ill.
McIver & Son, Alex. M., Charleston, S. C.
Potash Co. of America, Washington, D. C.
Southwest Potash Corporation, New York City
United States Potash Co., N. Y. C.

POTASH—Sulfate

American Potash & Chemical Corp., Los Angeles, California
International Min. & Chem. Corp., Chicago, Ill.
Potash Co. of America, Washington, D. C.

PRINTING PRESSES—Bag

Schmutz Mfg. Co., Louisville, Ky.

PYROPHYLLITE

Ashcraft-Wilkinson Co., Atlanta, Ga.
Pioneer Pyrophyllite Producers, Beverly Hills, Calif.

REPAIR PARTS AND CASTINGS

Atlanta Utility Works, The, East Point, Ga.
Stedman Foundry and Machine Co., Aurora, Ind.

SCALES—Including Automatic Baggers

Atlanta Utility Works, The, East Point, Ga.
Stedman Foundry and Machine Co., Aurora, Ind.

SCRAPER MACHINES

Sauerman Bros., Inc., Chicago, Ill.

SCREENS

Atlanta Utility Works, The, East Point, Ga.
Stedman Foundry and Machine Co., Aurora, Ind.
Sturtevant Mill Co., Boston, Mass.

SHOVEL LOADERS

Clark Equipt. Co., Benton Harbor, Mich.
Hough, The Frank G. Co., Libertyville, Ill.
Jaeger Machine Co., Columbus, O.

SPRAYS

Monarch Mfg. Works, Inc., Philadelphia, Pa.
Spraying Systems Co., Bellwood, Ill.

SPREADERS, TRUCK

Highway Equipment Co., Cedar Rapids, Ia.

STORAGE BUILDINGS

Butler Manufacturing Co., Kansas City, Mo.
Marietta Concrete Corporation, Marietta, Ohio

STORAGE TANKS

Broadway Rubber Corp., Louisville, Ky.
Butler Manufacturing Co., Kansas City, Mo.
Cole, R. D., Manufacturing Co., Newnan, Ga.

SULFATE OF AMMONIA

American Agricultural Chemical Co., N. Y. C.
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Bradley & Baker, N. Y. C.
Jackle, Frank R., New York City
Lion Oil Co., El Dorado, Ark.
Nitrogen Div., Allied Chemical & Dye Corp., N.Y.C.
Phillips Chemical Co., Bartlesville, Okla.
Woodward & Dickerson, Inc., Philadelphia, Pa.

SULFATE OF POTASH—MAGNESIA

International Min. & Chem. Corp., Chicago, Ill.

SULFUR

Ashcraft-Wilkinson Co., Atlanta, Ga.
Texas Gulf Sulphur Co., New York City
Woodward & Dickerson, Inc., Philadelphia, Pa.

SULFUR—Dusting & Spraying

Ashcraft-Wilkinson Co., Atlanta, Ga.
U. S. Phosphoric Products Div., Tennessee Corp., Tampa, Fla.

SULFURIC ACID

American Agricultural Chemical Co., N. Y. C.
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Bradley & Baker, N. Y. C.
International Min. & Chem. Corp., Chicago, Ill.
Lion Oil Company, El Dorado, Ark.
U. S. Phosphoric Products Division, Tennessee Corp., Tampa, Fla.

SUPERPHOSPHATE

American Agricultural Chemical Co., N. Y. C.
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Bradley & Baker, N. Y. C.
Davison Chemical Co., div. of W. R. Grace & Co., Baltimore, Md.
International Min. & Chem. Corp., Chicago, Ill.
Jackle, Frank R., New York City
McIver & Son, Alex. M., Charleston, S. C.
U. S. Phosphoric Products Division, Tennessee Corp., Tampa, Fla.
Woodward & Dickerson, Inc., Philadelphia, Pa.

SUPERPHOSPHATE—Concentrated

Armour Fertilizer Works, Atlanta, Ga.
Bradley & Baker, N. Y. C.
International Min. & Chem. Corp., Chicago, Ill.
U. S. Phosphoric Products Division, Tennessee Corp., Tampa, Fla.
Woodward & Dickerson, Inc., Philadelphia, Pa.

TALC

Ashcraft-Wilkinson Co., Atlanta, Ga.

TANKAGE

American Agricultural Chemical Co., N. Y. C.
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Bradley & Baker, N. Y. C.
International Min. & Chem. Corp., Chicago, Ill.
Jackle, Frank R., New York City
McIver & Son, Alex. M., Charleston, S. C.
Smith-Rowland Co., Norfolk, Va.
Woodward & Dickerson, Inc., Philadelphia, Pa.

TANKS—NH3 and Liquid N

Broadway Rubber Corp., Louisville, Ky.
Butler Manufacturing Co., Kansas City, Mo.
Cole, R. D. Manufacturing Co., Newnan, Ga.
KBH Corporation, Clarksdale, Miss.

TOXAPHENE

Ashcraft-Wilkinson Co., Atlanta, Ga.
Pittsburgh Coke & Chem. Co., Agr., Chem. Div., Pittsburgh, Pa.

TRUCKS—SPREADER

Highway Equipment Co., Cedar Rapids, Ia.

2, 4-D

Diamond Alkali Co., Newark, N. J.
Pittsburgh Coke & Chem. Co., Agr. Chem Div., Pittsburgh, Pa.

2, 4, 5-T

Diamond Alkali Co., Newark, N. J.
Pittsburgh Coke & Chem. Co., Agr. Chem. Div., Pittsburgh, Pa.

UREA & UREA PRODUCTS

Bradley & Baker, N. Y. C.
Grand River Chem. Div., Deere & Co., Tulsa, Okla.
Nitrogen Div., Allied Chemical & Dye Corp., N.Y.C

VALVES

Monarch Mfg. Works, Inc., Philadelphia, Pa.

ZINC SULFATE

Tennessee Corp., Atlanta, Ga.

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